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AMERICAN ARTISAN and Hardware Record

VOL. 84. No. 23. 620 SOUTH MICHIGAN AVENUE, CHICAGO, DECEMBER 2, 1922. $2.00 Per Year.

GUTTER CRIMPEDGE

Pat. March 12, 1912

Saves Time and Labor

Largest Manufacturers of Eave Trough and Conductor Pipe In the United States

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INTERLOCK — CONDUCTOR Pipe

The Most Perfect Conductor Pipe Made

"MILCOR" Flat Crimp Elbows and Shoes

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KUEHN'S KORREKT KORNER

TRADE MARK.

SEAMLESS

Steel Strap Hanger

"Triplex" Hanger

"Direct Drive" Conductor Hooks

"Self-Lock" Eave Trough Hangers

"Kuehn's Korrekt Korner"

If You Haven't Our Sept. Net Price List, Write for It.

MILWAUKEE CORRUGATING COMPANY

KANSAS CITY MILWAUKEE MINNEAPOLIS

QUALITY ALWAYS "MILCOR" TRADE MARK ABOVE PRICE

What an Architectural Engineer Says—

—about

THE FARQUAR SANITARY HEATING AND VENTILATING SYSTEM

The letter reproduced here is typical of the comment of Architects and Engineers after thoroughly investigating FarQuar claims.

MOTT X. CORCORAN
ARCHITECTURAL AND STRUCTURAL ENGINEER
VALPARAISO, INDIANA

October 25th, 1922.

The Farquhar Furnace Co.,
Wilmington, Ohio.

Gentlemen:-

I wish to thank you for the literature which you sent me. I have read it through carefully. Yours is the first real furnace that I have ever seen or heard tell of.

Kindly forward to me the prices together with the trade discounts and oblige,

Yours very truly,

Mott X. Corcoran

Distinctive FarQuar Features

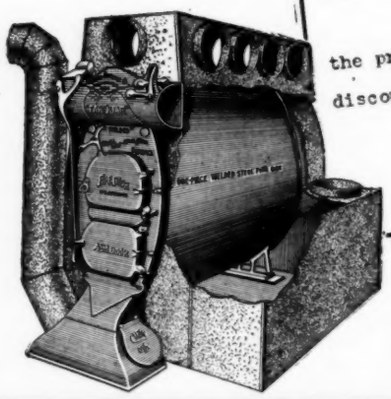
An Automatic Control, actuated by the fire-box itself, which insures a uniform temperature and positively protects against overheat and its consequent dangers, while also making only one firing necessary every twenty-four hours.

A Large Grate Area which insures slow combustion and a Long-Smoke Travel, which means fuel economy.

An electrically welded, one piece, Seamless Fire-box, which entirely prevents the escape of fire poisons.

A]Vent and Return System which insures distribution of heat to all parts of the house, regardless of the weather, also prevents hot and cold spots in any room.

Write today for full particulars — ask for free booklet



The Farquhar Furnace Company
212 FarQuar Bldg. Wilmington, Ohio

High Grade Representatives Wanted

Responsible Dealers are wanted as FarQuar distributors. The many exclusive FarQuar features offer unusual opportunities to those who can qualify.

NIAGARA FURNACES

Durable, Efficient and Economical

Made of Clean high grade pig iron

A profitable proposition for Dealers and users

Made by

The Forest City Foundry & Mfg. Co.

1220 Main Avenue Cleveland, Ohio

We are also makers of the Monarch Furnace

Founded 1880 by Daniel Stern

Thoroughly Covers the Hardware, Stove, Sheet Metal, and Warm Air Heating and Ventilating Interests

AMERICAN ARTISAN and Hardware Record

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VOL. 84. No. 23. CHICAGO, DECEMBER 2, 1922. $2.00 Per Year.

HAVE YOU A BUDGET FOR YOUR BUSINESS?

We have heard a great deal of talk about budgets during the past few years—both as to federal expenditures and in connection with commercial and industrial enterprises.

There have been many excuses made by those who do not follow such a system in their business—most of these to be classed in one group which claims that any system involves additional expense and "red tape."

And yet—when you really get behind the scenes, it will be found that the real objection is based upon a fear that at some particular time it might be necessary to spend money for some specific object — and then there would be no fund from which this money could be obtained.

This objection is not sound, for in any well arranged budget there will be a "contingent" fund, for just such occasions.

The chief benefit to a retail hardware store or a sheet metal or furnace business of a properly balanced budget is in the fact that the very budget makes it necessary for the management to plan ahead and to provide for funds with which to take care of current or extraordinary expenditures.

In other words, suppose John Williams finds that he did a business in 1922 of$40,000, with an invested capital of $10,000, that he had to borrow at certain periods $3,000 in order to discount his bills and to meet his pay rolls, and that he decides to make a real effort to increase his business to $50,000 in 1923, he must of necessity know where he will be able to borrow, say $2,000 more, or he will find himself at a critical time without the necessary funds to meet his pressing obligations—and instead of increased business and larger profits, he may lose his entire investment, due to the fact that he had not provided, in advance, for this extra borrowing need.

Here is another phase of the subject:

The very fact that you have a budget keeps you from spending too much money for various objects; it keeps you from buying too heavily; it keeps you "on the hump" to make your sales and collections up to the mark set up at the beginning of the year.

All of this tends to make your business more profitable, because, on one hand, it prevents you from taking on heavier obligations than you can carry with safety, and on the other hand, it makes you push your sales department more aggressively.

You avoid needless or unprofitable investment and you increase your sales and profits.

All of which is just what you want—isn't it?

* * *

The man who is always trying to play safe usually gets left when the real turn of the game is made.

So it was this fall.

There were those who would not place advance orders for even the most staple items. During the past two months they have been paying out enough in extra costs, without ever having a fair supply, to make quite a considerable item in the account of lost profits.

Random Notes and Sketches.

By Sidney Arnold

Blair Quick, who is one of the favorites of the sheet metal and warm air furnace men in Iowa, tells the following story about a certain congressman who has the reputation of being the neatest fence-straddler in the profession, a man who is always anxious to conciliate everybody:

A measure, on which there was a marked division of opinion, was about to come up.

"Will the gentleman vote for this bill if it comes up?" demanded a member, aiming a finger at the congressman in question.

The latter looked from one side of the house to the other and slowly answered:

"I will—"

Immediately the opposition broke into a storm of booing. As soon as the member could make himself heard, he continued:

"not—"

The other side was now in uproar and the speaker added hastily:

"—answer that question."

* * *

Even if E. S. Gellatly, Salesmanager of the Illinois Zinc Company, is a full bred Scot, he enjoys a joke at the expense of his countrymen, and here is one that he sent me:

A young man was on the point of leaving the house of his "best girl," when she said to him: "Sandy, haven't you forgotten something?" meaning, of course, the good-night osculatory exercises.

Sandy turned half way around and noticing the only half-emptied bag of peppermint candy, replied: "Ne'er mind, lassie, ye can keep the mints for next Tuesday nicht when I'll be around again."

* * *

Not that I would in any way insinuate that "Newt" Pierson of "Armco" fame, dances that way, here is a bit of colored wit that he and others will enjoy:

It was just after the Armistice when discipline had been relaxed to a certain extent that a big colored soldier reported at sick call as being unfit to drill. Pressed for reasons, he explained that he had danced all night and that he was physically fini.

"Feet sore?" inquired the medico sergeant sympathetically.

"Nossuh," retorted the buck, "tain't dam. But mah shoulders hurt an' Ah kain't tote no gun."

* * *

George Harms, who probably knows more sheet metal and furnace contractors than anybody else and who tries to sell them all "Handy" pipes—for their own good, you know—has spent several winters in Florida and the other day he told me a good story about one of his friends who had asked a negro if he knew of a bathing place free from alligators. The negro took him to a nearby spot and the visitor enjoyed his bath tremendously, staying in a half hour or more. After he came out of the water he asked: "How is it that there are no alligators here? Everywhere else I have tried to bathe the alligators have been too thick."

"Well, there's a reason, boss: Dese here alligators done been all scared away by the sharks."

* * *

H. E. Usinger, of Berger Brothers Manufacturing Company, tells me that it is the custom of certain stations on the Southern Railway to sell chicken patties and other delicacies to passengers.

A traveler who had enjoyed a patty and was leaning out of the window to buy another, asked of the dusky salesman:

"Where do you get your chicken?"

The darky rolled his eyes. "You-all f'om de No'th, ain't you, sah?" he queried.

"Yes," was the reply. "But why do you ask that?"

"'Case, sah; No gem'm'n f'om de South eber asks a colored man whar he gits his chicken."

* * *

"Good intentions may be all right," said J. Edwin Ellis, General Manager of the Independent Stove Company, "but deliver me from the fellow who does not know what his actions may result in"; and then he cited the following experience of one of his neighbors:

Father was annoyed. His expensive gold watch had failed him. It wouldn't go at all.

"I can't think what's the matter," he complained. "Maybe it needs cleaning."

"Oh, no, daddy," objected four-year-old Henry. "'Cause baby and I had it in the bathroom washing it all day yesterday."

* * *

Paul A. Florian, Jr., who is in charge of the fine advertising which is being done by the Vaughan & Bushnell Manufacturing Company, knows a good story when he hears it, and here is one that he thought well enough of to tell me again:

McGinnis was up in court on a charge of assault and battery on another workman employed on the same construction job and his face looked vaguely familiar to the magistrate.

"Haven't I seen you here before?" he demanded.

"Belike," admitted McGinnis. "I git up here every now an' then."

"Assault and battery, eh?"

"Well, sometimes one — sometimes t'other."

"As a matter of fact, haven't you been here four times in the last three months for fighting?"

"Mayhap—I'm not much on figgers."

"You're a regular bully, aren't you, McGinnis—always quarreling and picking a fight?"

"See here, Judge," retorted McGinnis with rancor. "I don't quarrel and I don't pick no fights. I just bust 'em one and go on about my business."

Facts of Warm Air Heating and Ventilating.

Reports of Progress in Warm Air Heater Research Work. Ventilating Factories, Theatres and Other Buildings.

Pipeless Furnace Suit Goes to U. S. Court of Appeals.

Upon the petition of the Monitor Stove Company, Cincinnati, Ohio, and the Homer Furnace Company, Coldwater, Michigan, plaintiffs in the patent infringement suit against the Williamson Heater Company, Cincinnati, Ohio, and the petition of the Monitor Stove Company as defendant in the patent infringement suit of the Williamson Heater Company vs. the Monitor Stove Company, United States District Judge John Weld Peck has granted appeals to United States Circuit Court of Appeals from his decrees entered in these cases several months ago.

That Same Chimney Problem Can Be Solved in Various Ways.

Uncle Ben Says That a Four by Twelve Inch Chimney Is More of a Bluff Than Anything Else.

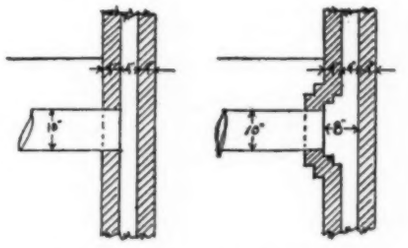
IN OUR issue of October 7th, on page 21, one of our Wisconsin subscribers submitted a chimney problem, the chief troubles in which was that an attempt was made to have a 4 x 12-inch chimney provide smoke outlet for smoke pipe which was three inches in diameter. Two solutions were published on page 37 of our October 21st issue.

The November issue of *Heating and Ventilating Magazine* contains and article which treats the same problem and we are glad to give further publicity to the solution furnished by the writer in that publication, the problem and its solution being presented in the following letters:

From Marie to Uncle Ben.

Dear Uncle:

We, I mean the ladies' society, put a new furnace in the parsonage this summer. Here it is almost November, and last Tuesday when the preacher built a fire in it because it promised to be a cold night, it smoked so badly that they had to sleep in the barn. Smoke came up all the registers. Smoke was so thick in the cellar that the preacher's wife sent for the neighbors, thinking the house was on fire. Tom Powers, the hardware man from town who put the furnace in, says the chimney is 4 inch by 12 inch, and 35 feet high. The pipe which connects the furnace to the chimney is 31 inches around by my tape measure, and I figure that it has 78 square inches area. I wonder how



they expected to make 78 inches go into 48 inches?

We can't make the preacher live in the barn all winter, and it is pretty late and cold to try to build a new chimney this Fall. Don't you think maybe we could cobble up some new way to make the chimney serve? The hardware man thinks the chimney is airtight. It runs up inside the house not outside. He made me a drawing to send you, showing how it is now, and how he wants to try fixing it. Will you advise us?

Yours lovingly,

MARIE.

Answer by Uncle Ben.

Dear Marie:

Your poor preacher is up against a regular trick that happens very often. In the first place, a 4-in. by 12-in. chimney isn't a chimney at all. It's just a bluff at being a chimney. It's not much better than a 4-in. diameter pipe, and under some conditions it isn't as good as a 4-in. diameter pipe. I have known of several flues shaped like this, in which the hot gases would rise up in one end, while the other end showed a downdraft. If you ever had a chance to look through a smoke flue or down a chimney, you would see the gases passing along in a spiral or whirling manner, and when the flue was rectangular you would see that the corners of the flue outside the whirling circle were full of little eddies and whirls which probably retard the flow of the main current more than they help.

That's why I say a 4-in. by 12-in. flue isn't much better than a 4-in. round one, and I believe the only reason why so many such flues seem to serve at all is that they are usually asked to serve only a 4-in. diameter smoke pipe from a stove.

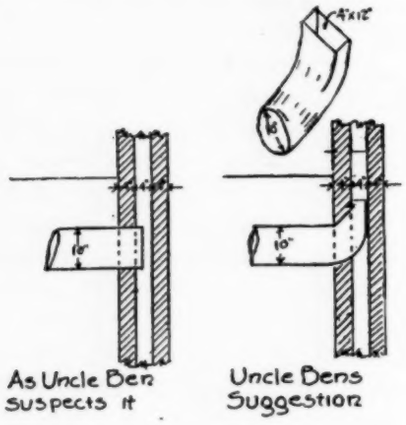
My judgment is that the preacher will have to live in the barn off and on until you get a chance to build a new chimney. When you do, by all means use a burned clay, airtight flue lining, and have it at least 10 in. in diameter or 10 in. square inside.

The remedy suggested by Tom Powers will, of course, help the condition somewhat, especially, as is often the case, the pipe sticks too far into the chimney. A smooth tapering steel elbow, which would reduce the danger of leakage and the friction might be installed as I have sketched it, and I think this would be better than Tom's scheme.

In a case like this, where the draft is weak, we must be exceedingly careful to prevent leakage. It

would be a good idea to cement up every crack with furnace cement, both in the smoke pipe and in the brick work around the pipe.

Use the ash-pit doors for controlling the draft, rather than the



check draft damper in the breeching, and cement up all leakage around this damper. There will then be less danger of gas pollution in the house.

Make sure that the chimney is tight and not porous through the attic and above the roof. Plastering the outside of a poor chimney in the attic has been known to help a bad draft over the hill. Make sure that there is an air supply for the furnace. Many a sluggish draft has been cured by heaving a lump of coal through a basement window. If you have an electric current you might set a fan to blowing air into the furnace room whenever an extra demand is made. Forced draft for many ships, you know, is obtained by creating an air pressure on the entire stokehold. The only escape for the air is via the furnaces and smokestack and they can force the fires very effectively in this way.

You might remember that your throat and your blood vessels and about all the ducts you can think of in Nature are circular. I'd admire to be shown any place where Nature uses a flue three times as long as it is wide.

Your affectionate Uncle.

Canadian Fuel Engineer Outlines Method for Firing with Soft Coal.

Too Much Draft Is Just as Bad as Too Little Draft for Best Results.

A NUMBER of articles have been published by us on the proper methods of firing of soft coal in warm air furnaces, and herewith follows another which contains valuable information which the installer may well pass on to his customers:

"Coal Truths on Handling Your Furnace" is the title of a set of instructions which are being sent out "with the compliments of the Province of Alberta, Canada."

"When burning soft coal," states the circular, "if the following simple rules are kept in mind, no trouble will be had and heating results will be obtained."

The circular then points out that soft coal contains a large portion of its fuel value which is burned as a gas. Taking a lesson from the gas stove, we know that gas will not burn without air and that if it is given insufficient air it will have a smoky flame. The circular then continues:

"In order to get heating results and economy you must supply air to the top of the fire.

"When you turn on the gas of the gas stove, you also use a match to light the gas. Place the coal in

Figure 1.—Shows How to Fire Soft Coal in Single Grate Furnace.

the fire so that the flames at one side will be the match to light the gas.

"As soft coal is much easier ignited than hard coal, less draft is required. If you have too much draft you will make gas faster than the capacity of the combustion chamber will allow it to burn. Therefore reduce the draft to its lowest possible point by regulation of the dampers.

"In order to obtain better control over the rate of burning the coal see that some ash is left on the grate before you adjust the dampers.

"You know that if you place a spoon in the flame of a candle it will become sooted up and very little heat obtained, and that if it is held clear of the flame it will not soot and will quickly become hot. Coal in the furnace has the same effect.

"By putting in the coal as shown in Figure 1, you provide the match

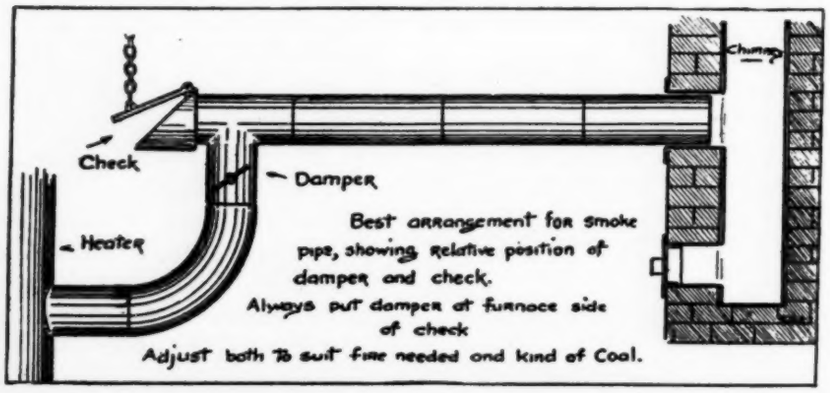

Chimney
Check
Damper
Heater
Best arrangement for smoke pipe, showing relative position of damper and check.
Always put damper at furnace side of check
Adjust both To suit fire needed and kind of Coal.

Figure 3.—Shows Proper Locations of Damper and Check on Smoke Pipe.

to light the gas, and also lengthen the flame so that it will not soot up. Once the gas has been fully consumed it cannot make soot. It is only when partially consumed that it has the properties of making soot and smoke.

"Try to Operate the Furnace with Ashpit Damper Closed if you cannot get results (after experimenting with the dampers and air inlet in the fire door); open the ash-pit damper slightly.

"If the weather is extremely cold or you wish to leave the fire for long period, make second firing as shown by Figure 2. The method is known as alternate firing from side to side.

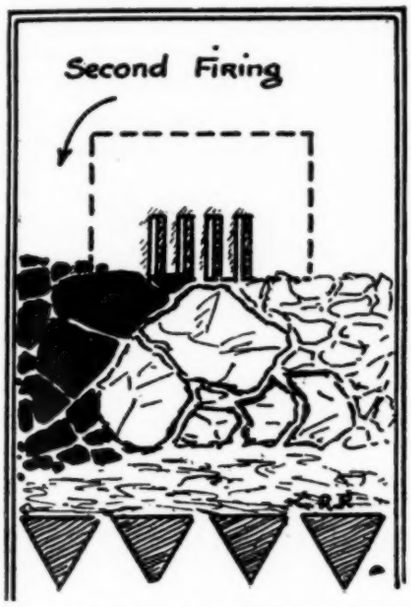


Figure 2.—How Second Firing Should Be Done.

You should place the lump coal as shown and fill in with the smaller coal. You will get better results by having some small than you would if using all big lumps.

"Handling the fire as instructed here, you should have no clinker troubles. Do not use the shaker too frequently. When necessary to clean the ashes from the sides of the fire-pot, use poker from under the grate, not through the fire door.

"Figure 3 shows means of regulating the draft and the best position of regulators. Never put the damper in the smokepipe on the chimney side of the check."

The foregoing directions are issued over the signature of R. G. Pratt, Fuel Engineer.

Program for Western Furnace and Supply Association Meeting.

From Secretary John H. Hussie we are in receipt of the program of the annual meeting of the Western Warm Air Furnace and Supply Association to be held at Hotel Sherman, Chicago, December 6. The program follows:

WESTERN WARM AIR FURNACE & SUPPLY ASSOCIATION.

Sherman House, Chicago, Dec. 6, 1922.

Call to Order—10 a. m.
Reading of Minutes of Previous Meeting.
Communications.
Report of Officers.
Report of Committees.
Address, Dr. E. Vernon Hill, E. Vernon Hill Co., Chicago.
Address, Mr. Enoch B. Seitz, Secretary, American Washing Machine Manufacturers Association.
Address, Mr. D. E. Cummings, Thatcher Furnace Co.
"Start Something Hour." Everyone present must take part. No rules—no restrictions.
Election of Officers.
Selection of Next Meeting Place.
Adjournment.

Advocates Fans for All Warm Air Furnaces.

A recent article in an eastern magazine contains an article in which a number of statements as to warm air heating and the use of fans in connection therewith are made, which we believe will be of interest to the installers of such apparatus, so we are glad to quote the following excerpts with a view of having others think about these statements and write us their opinions:

"Now while there are many defects and inaccuracies in our heating and ventilating systems, yet I will deal mainly with the questions of economy and heating; plants and furnaces.

"I will take a five-room residence for my illustration, although the principles may be used in all buildings, business houses and residences. I claim that heating furnaces, which are enormously popular, are installed wrong; most of them not giving results nor satisfaction, plus plenty of heat.

"Furnaces are usually installed near the end or side of the building, which forces the air to travel a long way, almost on a level or horizontal, which is contrary to natural laws. The tendency of hot air is to rise rather than to travel on a level and that against a current of cold air coming in under doors and cracks of windows.

"The furnace should be located as near the center of the house as possible for many reasons. One is, it would give off heat from itself which would be well distributed over the basement and would keep it warm and dry. The hot air in the pipes wouldn't have to travel so far. Furnaces should also be placed low so as to give the pipes an upward slope of at least 45°.

"Most people keep both their residences and business houses, schools, churches and theaters too warm for health or comfort. Overheating pleases most people, for they think that they are getting their money's worth.

"I know a concern that is making a specialty of re-installing furnaces and has much to do, and I learn that this firm is largely carrying out the ideas here advocated.

"Now, here is a suggestion to people who have already installed their furnaces and don't care to change them. Just place a fan at the mouth of the air feed pipe and force a current through the furnace in spite of all the manifold obstacles. A small fan will suffice for a small house and will cost about two cents a day to operate.

Would Reduce Outdoor Temperature Extremes.

"The time is coming, and should be now, when the extreme cold or heat in our cities will be modified and reduced a few degrees.

"When we consider, on one hand, the sickness, lowered vitality, reduced production, long and many vacations, loss of sleep and poor rest at night, wouldn't an investment in a cooling and heat-reducing system be a practical investment? It wouldn't be necessary to have cold storage; but just reduce the extreme heat or cold.

"On the other hand, the cold weather is hard on both health and comfort. People are housed in public and private buildings that are

hot enough for a Turkish bath. They go from this to the extreme outdoor weather, which is a sudden change and is shocking to the system. Aside from the shock and injury to health, it is uncomfortable and requires heavy clothing.

"If we of Colorado find it profitable and possible to heat up all outdoors to protect our fruit crops from early spring cold weather, why wouldn't our cities find it so, when we see so much of economy, beauty, health and benefits resulting therefrom? The same plant for heating could be reversed and be used for cooling."

Meyer Furnace Plant Fire Temporarily Halts Production.

The Meyer Furnace Company of Peoria, Illinois, well-known manufacturers of the Weir furnace, this week suffered a fire in that part of the plant devoted to furnace manufacture, but which will disturb only temporarily their fulfillment of the requirements of the trade. The company says it will only be a matter of a very few days until they can again live up to their reputation of good service to customers, and they supply the following account:

"A disastrous fire, of undetermined origin, early in the morning of November 27, completely demolished that part of the Meyer Furnace Company plant devoted to manufacturing Weir furnaces, and this, naturally, compels temporarily discontinuing operations. However, the main, large warehouse building and several other buildings remain intact, and arrangements are well under way for resuming manufacturing operations in the course of next five or six days, with new machinery and such of the machinery not seriously damaged by the fire, and we hope again to be in position to ship as usual in the course of ten days.

"Orders for repair parts are being handled as usual, without being delayed for shipment. The foundry, of course, also remains intact, and so the destruction of our plant does not interfere in the least with shipments of Warm Home furnaces."

Installers Say That Furnace Brushes Are Good Investment.

Most warm air furnaces are equipped with a small door on which the lettering "Clean Out" appears, but few people pay any attention to this door nor to what it hides until some day the furnace starts smoking or fails to produce the usual heat, and then they hunt high and low for something with which to "clean out" the accumulation of soot and dirt in the radiator—that

Wayne Wire Furnace Brush

is, unless they happen to have a Wayne wire furnace brush such as is shown herewith, for in that case it is such an easy matter to remove the soot that there is never any trouble of that sort.

Here is a suggestion in this connection.

Secure half a dozen of these brushes, send one of your men on a canvassing trip among the furnace users in your town. He will not only sell the brushes, but he will pay for his time by securing enough orders for repairs, etc., to keep a couple of men busy.

The Wayne wire furnace brush is made of round steel wire, the brush part being four inches wide, and it has a flexible wire handle, four feet long. The Hardware Specialty Company, Fort Wayne, Indiana, manufactures the brushes.

Save Heat and Relieve Coal Shortage, Uncle Sam Asks.

If every family in the United States saved one ton of coal the saving would mount into millions of dollars, asserts a bulletin of the Building and Housing division of the U. S. Department of Commerce. To relieve the coal shortage, householders are asked to inspect the windows, doors, transoms and floors for useless apertures which waste the warm air, and let in unnecessary amounts of cold air. The heating plant should be carefully examined, adds the bulletin, which declares:

Chimneys and stove pipes should be examined and cleaned out whenever necessary. Chimneys and stove pipes are intended to serve as flues and the clogging of them affects the proper burning of the fuel. When fireplaces and stoves are not in use the dampers should be closed.

The same care should be given to the heating plant as to one's automobile. If the furnace or stove is out of order fuel will be wasted just as gasoline is wasted when the automobile is out of repair. If cracks are found in the furnace it needs prompt attention. A cracked or broken grate should be repaired or replaced.

Advice as to the most efficient and economical use of fuel in various types of heating plants can be obtained in many cases from the makers of the plants.

There are few householders so situated that they can not save money by attention to weatherproofing and stopping heat losses. At the same time, they will be doing a good turn for their neighbors by saving fuel.

It costs more not to paint than to paint. Rust and rot go on till you check them. Paint and varnish NOW, or you'll pay far more later for repairs and replacements. Don't put it off—put it on.

Practical Helps and Patterns for the Tinsmith.

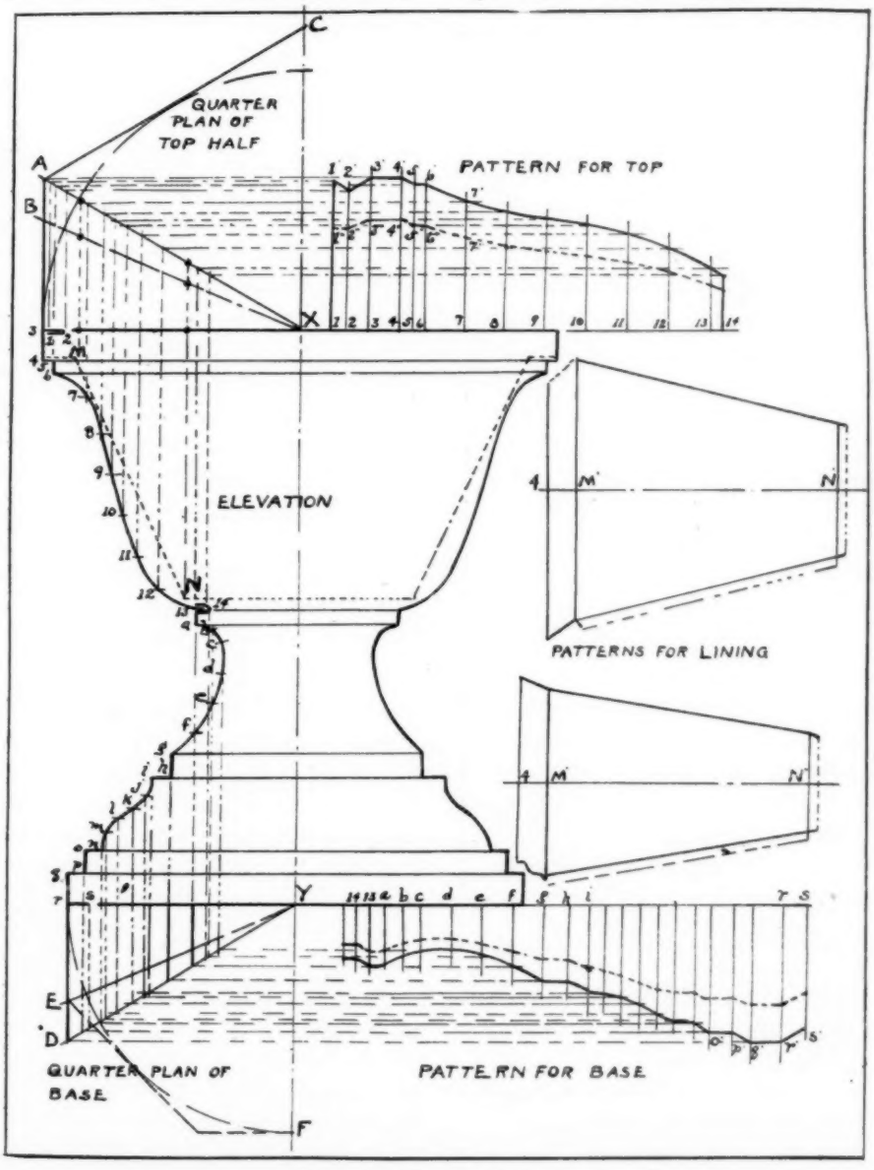
Aids to the Improvement of Craftsmanship and Business. News from Various Branches of the Sheet Metal Trade.

Patterns for Flower Vase.

By O. W. Kothe, Principal, St. Louis Technical Institute, St. Louis, Missouri. Written especially for American Artisan and Hardware Record.

The making of flower vases is very interesting for sheet metal men, who have homes of their own, and those who have not homes can make them for some of their friends. But all in all, most workmen, unless ill fortune has overtaken them, could possess a home at this time. Lawn vases, as we show in this drawing, can be designed to a great variety of shapes and can also be made in one of several ways; that is, make the vase 4 cornered, or hexagon or octagon or 12 sided, or hammer out the members and thereby make a circular vase. In this case, we lay out the patterns for a hexagon and an octagon.

First draw a center line indefinitely, and on the one side detail the vase, making the members and the curves as you feel they will look well. This means the members must be made to a proportion to suit the eye from a close vision, as well as from a distance. The designer must be careful and not to follow a similar practice of making lawn vase members, the same as he would members on a 4 or 5 story building. The matter of designing art is quite a study and it is not an easy matter to work out a unique design where all members have intimate relation to one another.



Plan for Flower Vase.

After this, we divide all curved lines in any number of equal spaces, number each point and bend as shown. A seam line is generally made between the bowl and the stand, as in point 14. Now for a hexagon, we draw a quarter plan as 3-A-C. Observe the line A-C is tangent with the quarter circle, since the quarter circle starts with point 3 and is tangent to the line 3-A. This enables drawing the miter line A-X. In the same way for the base we have the miter line D-Y for the hexagon. Now from each point in the elevation as from 1 to 14, we erect lines to the miter line A-X in points shown. Then from each point in the base from 14 to s, we drop lines to the miter G-Y. After this we pick the girth as 1-2-3-4-5, etc., to 14 from elevation and set on a line as 1-14 in pattern for top. This line should be an extension from 3-X of plan. From each of these points erect stretchout lines and then from each point in the miter line A-X, project over lines to intersect those in stretchout of similar number as in points 1′-2′-3′-4′, etc. Trace a line through these points of intersection and you have the pattern for the top. As this is only a half pattern, the other half must be reversed, and then all the other 5 sides can be marked from this one.

In the same way, in the pattern for base, we pick the girth as 14-13-a-b-c-d, etc., to s and set it on a line as 14-s, which is on the extended line r-Y of plan. From each point as 14-13-a-b-c, etc.,we draw stretchout lines and then from each inter-

section in the miter, D-Y, we bring over lines to intersect those in stretchout of similar number. This gives the intersections as s'-r'-t'-o', etc., through which a line is drawn and makes the miter cut for pattern.

Now if an octagon vase is desired, the treatment is similar, only in the quarter plan for base we set the octagon plan instead of the hexagon as r-E-F. Then E-Y is the miter line for the base, while B-X is the miter line for the octagon in the top half of plan. As these miter lines cross those lines which establish the hexagon miter line, we only need to pick out these intersections and extend them over into the patterns, which gives the miter cut shown by the dotted positions in pattern.

To lay out the inside pan shown by the dotted lines of elevation, which is for holding the earth and preventing water to seep into the moulded members of the vase, which may rust it; make the drawing as at M-N. The sides are laid out by picking these lengths and setting them on lines as M'-N', also M" and N". The former is for a hexagon vase and the latter is for an octagon vase. The width of the top and bottom lines are picked from the quarter plan of top, using the lines shown by the heavy dots in miter line. The bottom is not shown but would take on the shape of either an octagon or a hexagon as desired and made equal in size to what the elevation would require. Laps for seaming and riveting various members, also soldering, must be allowed extra.

Ambitious Tinsmith and Auto Mechanic May Specialize by Studying Radiator Repair Lessons of E. E. Zideck.

Expert Announces Scope of Series Which Will Begin in Next Issue of American Artisan.

Written Especially For American Artisan and Hardware Record By E. E. Zideck, Chicago.

ONE of the principal repair items in the automobile line is the *Radiator*. Owing to the delicacy of its material and construction, the radiator leaks frequently. Overheating and frost cause it to burst open. Dirty water poured in by a careless driver will stop its circulation. And while the everyday wear and tear will provide plenty of work to repairers, collisions, the use of preparations, and carelessness in freezing weather and in the selection of water for the radiator will necessitate entire core replacements; of which, by the way, this country requires *over two million* a year.

Of all the various lines of repair work created by the motor-car's having come into universal use, the Radiator Repair line is the least crowded. In fact, there are sections in the country where there is no radiator repairer within a radius of several hundred miles. The work having been done by the various automobile factories when cars were few, still necessitates the shipping and reshipping of the radiator, consuming weeks and months; meanwhile the car is standing idle. With the phenomenal increase in the number of automobiles, trucks and tractors used in the rural districts, the factories are unable to take care of the great amount of radiator repairs, and delays in re-shipping become provoking to owners.

Readers of AMERICAN ARTISAN AND HARDWARE RECORD *who are interested in Radiator Work and desire to perfect themselves in the technical knowledge, without which no good work can be done, are invited to study the forthcoming Lessons conducted by E. E. Zideck and do what is requested of them in the various notes prefacing the Lessons.*

They should send in their answers and E. E. Zideck will review same for their own and other students' benefit.

Mail your letters to "Radiator Repair Editor," care of AMERICAN ARTISAN AND HARDWARE RECORD, *620 South Michigan Avenue, Chicago.*

Radiator Repair Shops began to spring up when it was found that the factories were unable to satisfy their many customers all at once. And it is only a few years since distinct radiator repair shops came into existence in the larger cities. In smaller towns and in the rural districts the garages and the tinshops have attempted to do the work, but lacking trained help in the line and, mainly, not being familiar with the nature and construction of the radiator and therefore handicapped in making repairs to it, they still are open to any Radiator Repair Man who happens to come along and wants to work for them either for wages or on percentage.

It must be remembered that neither the automobile mechanic nor the tinsmith is capable of radiator repairs, if not specially trained for it. The auto mechanic's line differs diametrically from the work of a radiator repairer and does in no way fit into it. The tinsmith, being skilled in soldering, is better fitted to do repairs to radiators and might learn to do them efficiently if he tried, but if he has never studied the mechanism of a radiator, he will be just as inefficient as the former.

Conditions at the present time are these: while the large cities,

where most of the radiator factories are located, have a fair supply of men doing radiator repairs, they still lack really *trained* men in the line; and the smaller cities and the country at large, with the multitude of garage men, tinsmiths and sheet metal men all trying to fit themselves into the work, but not trained in it, and shifting back and forth between it, and their original calling, present a real vacuum for the man who has learned Radiator Repairing, knows it, and can prove his capacity by efficient service.

And since these conditions prevail, a man who takes up radiator repairing for a trade may hope for opportunities entirely absent in other lines. He will, if he commands the trade, receive pay far better than is customary in general automobile repair. He will be employed steadily and have no trouble whatsoever to secure a new place, should he want it. He will be welcomed wherever he goes in the country and, should he show willingness to settle down and start a shop where there is none of the kind, he will be supported and helped along to get established and stay.

The *Lessons* that are now appearing in AMERICAN ARTISAN AND HARDWARE RECORD have been prepared with the end in view to completely train the student in, and fit him out for, any and all *repairs to radiators.*

The actual work of making these repairs is easy, if one knows *how.* The *skill* in the handling of the tools is acquired gradually as one does the work, but the *knowledge of what to do and how to do it* is more important than the mere skill. This knowledge by which the hands are directed that operate the tools, it should be said, is all important in *radiator repairing.* One must *know* the radiator and its condition first; then one may proceed to do work upon it that will be beneficial to it.

Thus the *Lessons* are divided into three parts: the first imparts Knowledge of the Radiator; the second tells of its condition when needing repair; and the third part outlines the process of restoring the radiator to its previous satisfactory status.

It is evident that an essential element in restoring something to its former status is the knowledge of *what* that status was.

Repair, in fact, means restoration to a former orderly status of something which has become broken, damaged, displaced or out of adjustment to the *condition* in which it was when not broken, damaged, out of place or adjustment.

To repair a radiator, then, means to restore it to its previous satisfactory status.

But how can anybody attempt to restore something to a previous condition, if he is *ignorant* of what that condition was? On the other hand, if I know the radiator, am familiar with its working status, have a thorough knowledge of what a radiator is, of its parts, their arrangement, their individual and collective purposes, in short, know the nature, construction and function of the radiator, then I am enabled to tell *at a glance* what is wrong with it and what must be done to *restore* it to its good working condition. Knowing *what* to do to a radiator in order to repair it, is a purely technical matter; one of facts and memory, not of tools and skill. It can be learned from these Lessons without actually seeing or touching a radiator. And without this knowledge to guide in the actual operation upon the radiator, *something* might be done to it, but with no assurance of a complete *repair.*

The second part, that of telling the condition of the radiator when in need of repair, is also a matter of facts. It also can be learned without touching the radiator. It undertakes to describe *the condition* of the radiator when out of order, to compare this "out of order" condition with the condition described in the first part, i. e., *the satisfactory condition,* and to point out that which is unsatisfactory, bringing out the *difference* between these two conditions.

It establishes beyond doubt or uncertainty *the difference* between the satisfactory and the unsatisfactory status of the radiator. And by establishing this it also indicates how this *difference* may be *removed.*

The difference removed means equalization of the two conditions, or the creation of but *one* condition,—the previous orderly, natural one. The removing of the difference practically is the *restoration* of the radiator to its proper status. It means *actual repair.*

The third part, finally, tells of the processes employed in removing the difference in the above two conditions. It *describes* how the actual work of removing the difference is ordinarily done. And it tells *how* it should be done in the easiest and best manner known.

The man who *knows* how a certain operation should be done to save time and trouble and insure best results, is *two-thirds* trained to do it. What remains for him to do is to get the tools and use them in the manner he may *learn* from these Lessons. Let him get a discarded radiator or two, which he can buy at any of the junk shops for 10 cents a pound, and let him practice on them. If he follows instructions given to him in these Lessons, he will acquire the *skill* in handling the radiator and the tools presently, and with the *knowledge* of what a radiator is and what is its proper status he will be able to *repair* any of the many makes readily and efficiently in a comparatively short time.

Should he then continue to study in the radiator line, applying what he reads to his work, learning the various "kinks" of which there are aplenty in any line of work, and using his brains as he goes along, he will become expert at it, fit to tackle any problem in the field.

For such men there is opportunity to obtain positions as superintendent of radiator repair shops maintained by large firms or, should he be inclined to work for himself, to start a shop in any of the county seats throughout the country and become independent for life.

My twenty years experience with apprentices and *learners* in general has been that they will learn effec-

tively only when their *brains* are at work with their hands. In other words: Give the average person, the young man especially, a *problem* to solve, and he is *interested.*

Once his interest is centered upon a subject, he will grasp it readily and try his best to do justice to it. I have, therefore, selected the method of *asking questions* in the Lessons that follow, as the most effective one in arousing interest in the learner and making him use his brains. He will find it more interesting to answer *questions* than to read and remember *facts.*

But this alone will not do. The reading of statements and using their content for answering identical questions will not interest him for long. Also, it will not be using much of his brains.

I have gone further than that: I am asking questions which will make him *think.* He will have to think, and think hard sometimes, if he wants to answer some of the questions I ask him; and by *thinking,* he will be able not only to evolve correct answers to my questions, but also to *regard them as a product of his own thinking.*

The producing of logical conclusions in one's own brains will undoubtedly leave more marks in it than the mere memorizing by reading can possibly do.

And this is, in fact, what I intend should be done. The student, given a portion of relevant facts in the respective *statements* I make for his benefit, will be forced to evolve them into *conclusions of his own* and, as such, let them answer what I ask.

I have tried to guard against false conclusions imbedding themselves in his mind by having him *review* his own answers in the light of subsequently learned facts and correcting them as he proceeds to gain in knowledge.

It is his *interest* and the *co-operation* of his brains I am invoking by this method and, even should there be shortcomings in it, making mistakes possible, what I am concerned in is not whether he will have to correct a few of his own answers as he goes on, but in *inducing him to learn.*

Of what good are the best books in the line to the man to possess them and glance at their pages occasionally, but never find in them the particular things he needs to know at that particular time? Have we not aplenty of that kind of books lying idly upon the shelves, because the method of imparting the knowledge they contain did not succeed with the men who bought them?

In these Lessons I am giving the man who thinks he might or would like to know the Radiator Repair field something that will *interest* him from start to finish and, mainly, *make him perfect himself* in whatever are the requirements of the trade.

The first Lesson appears here in the next issue.

Expert to Teach Cost and Accounting System in Sheet Metal Industry for American Artisan Readers.

George R. Doyle, Formerly Head of Accounting Service Department, National Trade Extension Bureau, to Write Series.

THE AMERICAN ARTISAN AND HARDWARE RECORD has been on the watch for a long time for an accounting and cost system suitable for the sheet metal industry. It has been our intention, when the proper system was found, to publish a series of articles, describing it fully, for the benefit of our readers.

Several systems have been offered to us but in each case they were not able to withstand the test of being simple enough to be readily understood by the small contractor. Our patience has been rewarded, finally, and it gives us a great deal of satisfaction to announce that in our next issue of December 9th, the first of a series of illustrated articles will appear, describing this system fully.

When we tell you that the author of this system, and the writer of these articles, is George R. Doyle, who was formerly in charge of the Accounting Service Department of the National Trade Extension Bureau of the plumbing and heating industries, we believe you will agree with us in our selection for this work.

To those in our industry who do plumbing in connection with sheet metal work, as many do in certain parts of the country, Mr. Doyle needs no introduction. During his connection with the Trade Extension Bureau he became thoroughly established as an authority on accounting for the plumbing and heating contractor.

For the benefit of those who are not familiar with Mr. Doyle and his previous work a few words of introduction might be of interest.

Mr. Doyle has spent his entire business life in this line of work. He has been engaged in manufacturing and merchandising accounting in many different lines and has a thorough and complete knowledge, not only of the fundamental principles, but of all the improved methods that have been worked out during the last twenty years. This, coupled with his wide experience, make him especially fitted for the devising of accounting systems and forms.

No better proof of this can be found than in the complete system of accounting which Mr. Doyle devised for the plumbing and heating

industries. It has been on the market now for three years and its use by men in that line has increased from year to year until it is now recognized as the standard method of accounting in that industry. Desiring a wider field in which to work, Mr. Doyle branched out for himself into public accounting. He enjoys a large practice in his home city of Evansville, Indiana.

The system which will be described in the AMERICAN ARTISAN AND HARDWARE RECORD, follows somewhat along the lines of the plumbing and heating system. This is quite natural because conditions, as far as accounting is concerned, are similar. In both cases it is *absolutely necessary* to know what the cost and profit is on each job. Without this information no sheet metal contractor can operate his business on a profitable basis.

The system to be described takes this as the fundamental basis and shows the contractor at all times just how much, in labor and material, is invested in the job.

It enables him to determine, as the job progresses, whether or not he has estimated correctly. It stops leaks in material lost on jobs because it gives an absolute check on the material sent out on the job and the material returned. It enables the contractor to tell for how long, and just who, worked on the job. Comparison of this information with the estimate of labor to be required will show whether or not the job has been correctly estimated.

Upon completion of the job the proper overhead can be applied and the actual gain or loss determined then and there. Best of all this information is "tied in" with the *money spent, material purchased, charges to customers, bank account* and other bookkeeping figures so that danger of error in *costs and profits* is minimized through proper checks on accuracy.

To the reader it may seem as though all this involves a world of detail that would swamp the average "Tinner." Such is not the case. All this is done with but a few forms and no more work than is being given at this time by many contractors to systems that give them no information whatever.

All forms used in the system will be illustrated with entries on them and these entries described so that you can follow them out and understand them for yourselves. The AMERICAN ARTISAN will of course arrange matters so that any questions that may be asked will be submitted to Mr. Doyle and answered by him either direct or through these columns as circumstances may warrant.

Be on the watch therefore for the December 9th issue. If your subscription is about to expire, better renew it immediately so you will not run any risk of losing the first article. Follow them closely and see how easily proper records of your business may be kept, that will turn past losses into future profits.

Corrugated Zinc Sheets Possess Many Advantages Over Galvanized Sheets and Composition Roofing.

First Cost of Installation Is Total Cost, as There Are No Expenses for Maintenance.

IN THE following we quote extracts from a pamphlet recently issued by the Illinois Zinc Company, which furnish important information to the sheet metal contractor who is familiar with the many advantages which zinc roofing possesses over baser metals and composition roofings:

Corrugated zinc sheets surpass all other forms of corrugated metal sheets in their resistance to the weather, and being non-corrosive, the elements have no appreciable effect upon the life of zinc. A zinc roof which has been laid for many years will have substantially the same weight of metal as when newly laid.

Zinc has been the standard roofing material in use in many countries of Europe for over a century and there are numerous existing structures which has been roofed with this excellent material for periods varying from fifty to over one hundred years, all of which are in good service at the present day. In the year 1811 portions of the roof of the Church of St. Barthelemy were covered with zinc and it is still in good condition. The German Imperial Palace and the University of Bonn in Germany, and the Canterbury Cathedral and Haymarket Theater in England, are among the larger buildings of Europe which have been successfully roofed with zinc for many years.

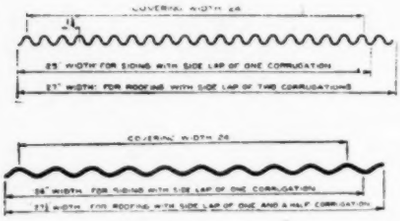
Corrugated sheets of galvanized (zinc-coated) steel or iron, or steel sheets coated with asbestos, felt and pitch, are unprotected at the nail holes and edges and are subject to corrosion wherever such points are exposed to the weather. Mechanical abrasion, such as will be caused by cleaners or workmen walking on the roof, will seriously expose a fresh metal surface and subject it to rapid deterioration. Corrugated zinc does not require a protective coating, for it will not rust regardless of the manner in which it is exposed.

Corrugated zinc sheets do not require painting or coating, but they can be painted if desired. Unpainted zinc sheets quickly form an oxidized surface which presents a soft, silver-gray color, which harmonizes with any setting. The painting of zinc is but seldom desired and never actually required.

Corrugated zinc sheets compare favorably in price with similar sheets of other metal. Their cost is not excessive. When corrugated sheets of galvanized or black steel are used and painted, the extra cost of painting added to the initial cost of the steel sheets increases the installed cost, so that it is greater than the cost of corrugated zinc, which

does not require painting or further attention.

Corrugated zinc sheets are maintained without any cost whatever.



Corrugated sheets of other metals require frequent painting of all exposed surfaces to secure a maximum of service. In point of first cost, maintenance and service, corrugated zinc is the most economical of all forms of corrugated sheets. When the supporting structure has served its purpose, the zinc can be salvaged and sold at a price equal to about 70% of the slab zinc market. Zinc sheets retain their weight of zinc indefinitely, regardless of the service to which they have been placed.

Corrugated Zinc Sheets are made in standard lengths of 5, 6, 7 and 8 feet and in standard widths as shown above. Special sizes can be furnished up to 12 feet in length and in widths as follows:

Maximum widths (1 corrugation lap), Number 12 gauge or more, 37", covering width 35.

Maximum widths (1½ corrugation lap), Number 12 gauge or more, 38½", covering width 35.

Maximum widths (1 corrugation lap), Number 11 gauge or less, 38½", covering width 36.

Maximum widths (1½ corrugation lap), Number 11 gauge or less, 39½", covering width 36.

APPROXIMATE WEIGHTS PER SQUARE

GAUGE Nº	CORRUGATIONS		
	1¼" x ⅜"	2½" x ⅝"	2½" x ¾"
9	75 LBS.	73 LBS.	79 LBS
10	84 "	83 "	90 "
11	100 "	102 "	112 "
12		119 "	131 "
13		132 "	149 "
14		146 "	168 "
15		162 "	187 "
16		181 "	200 "

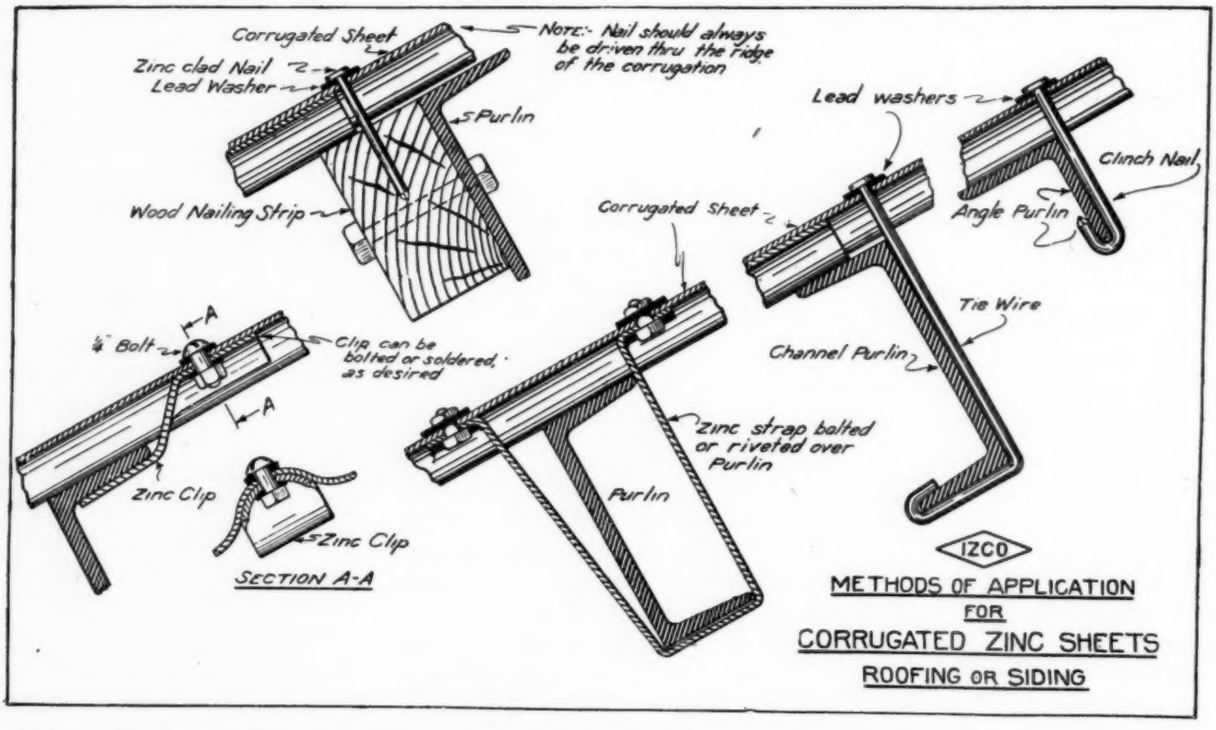
Although there is some economy of metal in the use of wide sheets, we recommend the use of the standard widths of 26" and 27½" wherever possible. The narrow widths are easily handled and form a more rigid construction; the lapped joints acting as ribs to the sheets.

COMPARISON OF GAUGES

STANDARD ZINC GAUGE			UNITED STATES STANDARD STEEL SHEETS			
			BLACK SHEET (ACTUAL)		GALVANIZED SHEET (NOMINAL)	
GAUGE Nº	THICKNESS INCHES	WT IN LBS PER SQ FT	GAUGE Nº	THICKNESS INCHES	GAUGE Nº	THICKNESS INCHES
9	.018	67	26	0187	29	.0179
10	.020	.75	25	0218	28	.0195
11	024	.90	24	.0250	26	.0226
12	028	1 05	23	.0281	24	.0289
13	.032	1 20	22	.0312	23	.0320
14	.036	1 35	21	.0343	22	.0351
15	.040	1 50	20	.0375	20	.0414
16	.045	1 68	19	.0437	19	.0476
17	.050	1 87	18	.0500	18	.0539

The American Zinc Institute recommends for corrugated zinc roofing, a minimum of Number 11 zinc gauge, and for corrugated zinc siding, a minimum of Number 10 zinc gauge.

Rolled zinc is gauged by the Standard Zinc Gauge. For purposes of comparison to this standard, the following table shows the relative gauges of black and galvanized iron.



Corrugated Zinc Sheets can be applied with any of the common methods of fastening used for this purpose. Due consideration should be given to the expansion and contraction of the metal and preferably zinc fastenings should be used.

When corrugated zinc sheets are applied to wood construction, pure zinc or zinc-clad nails, or galvanized bolts with lead washers may be used. On steel construction, zinc clips or straps may be soldered to the sheets or riveted with tinned rivets, or the sheets may be attached to the steel by using the ordinary galvanized clinch nail with lead washers.

Calculations for the loading capacity of corrugated zinc sheets should be governed by the thickness or gauge of the sheet, the depth of corrugations and the span between the purlins or supports.

A greater depth of corrugation allows a greater load for a given gauge of metal, but deeper corrugations do not always effect an economy, for a sheet of deep corrugations has a greater width before corrugating than the same sheet would have with shallow corrugations, and therefore weighs more. Preference should always be given to sheets of greater thickness or gauge of metal rather than a depth of corrugation. The use of a heavier gauge provides a greater protection of metal, at a slight increase in cost.

For a comparative example: A Number 14 gauge zinc sheet with 7/8" corrugations has a loading capacity which is equal to a similar sheet of steel of Number 22 gauge, or Number 15 gauge zinc sheet to a Number 20 gauge steel sheet. A comparison of loading and gauges between steel and zinc sheets shows that zinc must be of a heavier gauge than steel under the same load.

COMPARISON OF GAUGES

STANDARD ZINC GAUGE			UNITED STATES STANDARD STEEL SHEETS			
			BLACK SHEET (ACTUAL)		GALVANIZED SHEET (NOMINAL)	
GAUGE Nº	THICKNESS INCHES	WT IN LBS PER SQ FT	GAUGE Nº	THICKNESS INCHES	GAUGE Nº	THICKNESS INCHES
9	.018	67	26	0187	29	0179
10	.020	75	25	0218	28	0195
11	024	90	24	0250	26	0226
12	028	105	23	0281	24	0289
13	032	120	22	0312	23	0320
14	036	135	21	0343	22	0351
15	.040	150	20	0375	20	0414
16	045	168	19	0437	19	0476
17	050	187	18	0500	18	0539

TABLE OF SAFE LOADS
CORRUGATED ZINC SHEETS
FOR SHEETS COVERING TWO SPANS

2½" x ⅝" CORRUGATIONS
SAFE LOAD IN LBS PER SQ FT ~

SPAN IN FEET	GAUGE OF SHEET							
	9	10	11	12	13	14	15	16
2'-0"	448	498	598	697	797	897	996	1121
2'-6"	287	319	383	446	510	574	638	717
3'-0"	199	221	259	309	354	395	443	498
3'-6"	146	163	195	228	260	293	325	366
4'-0"	112	125	149	174	198	224	249	280
4'-6"	89	98	118	148	157	177	197	221
5'-0"	72	79	96	112	128	143	159	179
5'-6"	59	66	78	92	105	118	132	148

2½" x ⅝" CORRUGATIONS
SAFE LOAD IN LBS PER SQ FT

SPAN IN FEET	GAUGE OF SHEET							
	9	10	11	12	13	14	15	16
2'-0"	627	697	837	976	1114	1255	1395	1569
2'-6"	402	446	536	625	714	803	893	1004
3'-0"	278	309	372	434	496	558	620	697
3'-6"	205	228	273	319	366	409	455	512
4'-0"	157	174	209	244	279	337	349	392
4'-6"	124	138	165	193	221	249	276	309
5'-0"	100	112	134	156	179	201	223	251
5'-6"	83	92	111	129	148	166	184	208

NOTE: For sheets covering only one span, use 60% of the loading shown in above tables.

Corrugated sheets should be of a sufficient length to cover two spans to secure the full merits of the sheet and to provide for a maximum of purlin spacing.

Sheets covering single spans only should be avoided wherever possible.

The best practice provides for a 6" lap for roofing sheets, i. e., each sheet extends 3" beyond the center of outer supports.

Where sheets do not support a constant load, i. e., as in siding, the use of shorter end laps is warranted.

SQ. FT OF CORRUGATED SHEETS REQUIRED TO COVER 100 SQ FT

SIDE LAP	END LAP IN INCHES					
	1	2	3	4	5	6
1 Corrugation	110	111	112	113	114	115
1½ "	116	117	118	119	120	121
2 "	123	124	125	126	127	128

Correspondence with our Sales Engineering Department is invited to determine the proper gauge of corrugated or plain sheets required to obtain the most satisfactory service.

Copper Used to Make Sheet .000,000,5 Inch Thick.

Copper played a controlling part in a new wonder of gold-working whereby gold sheets were made so thin as to be actually transparent.

Plates of Copper were immersed in an electric bath and plated with gold until the yellow color was just visible.

Then they were removed and put into nitric acid, which, after a few days, dissolved the Copper and left a film of gold so thin that it floated upon the surface of the liquid.

These gold sheets were 1/2,000,-oooth of an inch in thickness. Ten thousand of them would have to be placed one upon another to be as thick as a single sheet of an ordinary newspaper.

A Popular Priced Hand Punch.

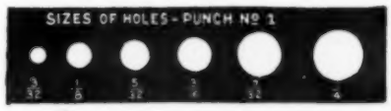
The Machine Appliance Corporation, 351 Jay Street, Brooklyn, New York, has brought out a series of hand punches for sheet metal workers which considering the prices asked are claimed to be exceedingly good values.

One of these is shown in the accompanying illustration, together with a chart of the sizes in which the different punches come. Each

Samson Hand Punch.

set consists of one punch and one die, the 3/16 inch being the standard of the Samson Number 1. A set sells at retail for $3.00, and with five other sizes included the retail price is $5.00.

The 3/16 inch punch will cut through 20 gauge soft metal, and



Showing Sizes of Holes.

through ¼ inch of leather or cardboard without effort.

Full particulars may be obtained from the makers, the Machine Appliance Corporation, 351 Gay Street, Brooklyn, New York.

Terre Haute Prepares for Indiana Sheet Metal Meet.

A meeting of the general committee in charge of arrangements for the 1923 Convention of the Indiana Sheet Metal Contractors' Association was held Tuesday, November 28th at Terre Haute, where the Convention is to take place.

The dates were set for February 21 and 22, 1923. No exhibit will be held, and there will be no long talks on extraneous subjects, the business sessions being devoted exclusively to discussions on matters which pertain strictly to the sheet metal and furnace business.

In the way of entertainments, arrangements are being made for a big banquet and a theatre program.

The following were present:

John C. Gardner, President of the State Association; Karl Roth and Paul R. Jordan, of the Aux-

iliary; A. W. Dudley, President; James F. O'Connell, August Hartmann and S. L. Fenner, the last four representing the Terre Haute Local.

It is expected that about two hundred sheet metal contractors of the state will be in attendance.

Bronze for Window Trim Becoming Popular.

The windows in the recently completed twenty-two story building of the Standard Oil Company at San Francisco are equipped with solid Bronze window fixtures. The fixture used is a very ingenious arrangement of Bronze track and arms by means of which the sash is tilted instead of sliding in the frame, says the Bulletin of the Copper & Brass Research Association.

With this arrangement the entire frame opening is available for ventilation if desired, and as the fixtures are so designed that no part of the sash protrudes into the room the openings can be completely screened. The sash can also be reversed for cleaning or reglazing from the inside of the building. A spring bronze weather-strip is used in conjunction with these fixtures.

This modern building is 326 feet high and contains twenty-two stories in which there are 2,080 window openings. Nearly six tons of Bronze bars were required for the manufacture of these fixtures alone. The other window hardware such as fasteners and window pulls are also of solid Bronze.

The Standard Oil building is one of the several modern office buildings on the Pacific Coast which have been equipped with these window fixtures, and they have proven so satisfactory that they are now being installed in many Eastern buildings. Since their introduction into the east this device has been very enthusiastically received, so that to date over one hundred and fifty tons of Bronze bars and moulding shapes have been required to fill specifications.

A genius is a man who is not much good at anything else.

Calls U. S. Land of Counter Jumpers.

America is a nation of "counter jumpers," according to William G. Shepperd, of Colliers' Weekly, who addressed the annual convention of the Association of National Advertisers at Atlantic City, recently.

"The man power of the United States is about 30,000,000 and ten per cent of this is behind counters," said Mr. Shepperd. "Nearly two-thirds of the 3,000,000 men and women behind counters are engaged in selling food and clothing. For every three farmers in the United States there is some one behind a counter. For every four workmen in the factories of the United States there is a store clerk or a store managr or a store owner waiting to sell what the workmen produce. We think we have a lot of railroad men in the United States. We have, but it takes as many store clerks standing behind counters to sell goods to use as it does men to carry these goods in transportation, to keep the railroads in repair and to keep the rolling stock in good condition.

"For every forty families in the United States there is a retail store," the speaker continued. "Struggling under this heavy burden these American families have discovered that the job can not be done by having only one member of the family at work. There are 24,000,000 families in the United States, almost 42,000,000 men, women and children work for wages or salaries. It has actually come about that Dad, who used to feed and clothe the old fashion American family of five persons, has unwittingly found himself unable to hold up his end of economic progress.

"Advertising," said Shepperd, "will help the consumer establish real business relations with the retailer. Advertising will teach the public that one good store conducted by a retailer who has a sense of public service is better than half dozen stores that only light up the sidewalk at the expense of the consumers, with a garish glare that doesn't mean anything but a challenge to all other stores in the battle royal of retail competition."

Notes and Queries

"Dangler" Gas Range with "Lorain" Regulator.

From W. J. Parry and Son, Youngstown, Ohio.

Please let us know who manufactures the Dangler gas cooking range equipped with the Lorain Oven Heat Regulator.

Ans.—Dangler Stove Company, Division American Stove Company, 5017 Perkins Avenue, Cleveland, Ohio.

"Garland" Furnace.

From Frank J. Rieder, 908 Chartiers Avenue, McKees Rocks, Pennsylvania.

Kindly inform me who makes the "Garland" furnace.

Ans.—Michigan Stove Company, Adair and Jefferson, Detroit, Michigan.

"Richardson" Water Heater.

From Brizee Metal Works, Twin Falls, Idaho.

Please give us the address of the makers of the "Richardson" water heater.

Ans.—Richardson and Boynton Company, 31 West 31st Street, New York City.

"Sanistat" Oven Heat Control.

From W. J. Parry and Son, Youngstown, Ohio.

We should like to know who makes the "Sanistat" Oven Heat Control.

Ans.—American Range and Foundry Company, Minneapolis, Minnesota.

Address of United States Radiator Corporation.

From Brizee Metal Works, Twin Falls, Idaho.

Where is the United States Radiator Corporation located?

Ans.—133 East Grand River Avenue, Detroit, Michigan.

Locks for Post Office Boxes.

From Johnson and Ginthardt, Sheffield, Illinois.

Can you tell us who makes locks for post office boxes, these to be of the key or the keyless automatic keyless lock types.

Ans.—Keyless Lock Company of Indianapolis, Indianapolis, Indiana; Iowa Lock and Manufacturing Company, Burlington, Iowa.

Summary of Tests by British Heating Engineers on Efficiency of Ranges Contains Much Useful Information.

Manufacturers as Well as Retailers of Kitchen Ranges Will Find Helpful Suggestions by Careful Study of This Summary.

THE following is a summary of the investigations into the efficiency of ranges and cooking appliances carried out for the British Building Materials Research Committee. A report of these tests has been issued in a Special Report, Number 4, of the Fuel Research Board. The full report contains 55 pages and 15 charts and diagrams. Copies of this Special Report may be obtained through any book seller or from H. M. Stationery Office, Imperial House, Kingsway, W. C. 2, London, England.

The Building Materials Research Committee, in May, 1918, requested Mr. A. H. Barker, one of the best-known authorities in heating and ventilating matters, to undertake an investigation into the relative merits of various kitchen ranges to determine types which might be standardized for housing schemes.

In the design of British cooking ranges, attention has hitherto been mainly devoted to securing cheapness of construction and convenience of use. Economy in fuel consumption has only played a minor part in determining the different types in use. The shortage and high price of coal have, however, emphasized the necessity for fuel economy and, consequently, of an examination of the efficiency of British kitchen ranges. It was realized that if the factor of fuel economy were fully taken into account in the design of cooking appliances it would probably have an effect upon the other two factors mentioned above. The experiments conducted by Mr. Barker have demonstrated that the actual combination of functions in a cooking range is, in itself, a very wasteful feature. In so far as a cooking range is suitable for one purpose, it is almost of necessity extravagant for others. The essential principle of economy in the use of heat is that the heat developed shall not be allowed to escape in any other direction than the desired one. When a range is used for warming a room, for instance, it is obvious that the ready escape of heat into the room is an essential feature of the apparatus. It can not, therefore, be economical for other purposes such as boiler or oven heating, for which it is necessary that the heat shall not readily escape.

It must be recognized, however, that a deep rooted prejudice undoubtedly exists in various parts of the country, particularly in the North, in favor of certain old-fashioned types of open range, and this is a factor which can not be ignored. The Yorkshire range, for example, which is to be found in most working class cottages in mining districts in the north is designed to fulfill the following functions: (1) To throw out a considerable amount of radiant heat for heating and roasting purposes. (2) To provide an open fire for general cookery, boiling, etc. (3) To dry clothes. (4) To bake bread and serve for other oven operations. (5) To heat water for baths.

This strong prejudice in favor of an open-fronted fire appears to be peculiar to this country. In most other countries a cooking range fire is usually closed. In an up-to-date French range the fire can not be seen unless the top covering is removed. The fire is enclosed to such an extent that only sufficient air is allowed to enter to create the necessary combustion. In view, therefore, of the scarcity and high price of coal at the present time, it appears to be a matter for serious consideration whether steps should not be taken to encourage the more general adoption in this country of ranges which are more economical in fuel consumption than those of ordinary British design.

The following is a summary prepared by Mr. Barker of his reports on the tests of cooking ranges:

The kitchen range is a combination of several different apparatus, such as a fire-heated oven, fire-heated hot-plate, fire-heated hot-water supply boiler. It is frequently also intended, especially in small houses, to serve as a means for warming the room in which it is fixed. It has to serve for such purposes as boiling kettles, toasting bread, drying clothes, warming plates, and similar duties. All this work is designed to be accomplished by one fire.

The technical "efficiency" of a range is difficult to determine definitely because it is shown to depend to a large extent on the kind of fuel used, the way in which the fuel is burnt, and other factors, also on the conception adopted of the meaning of the expression "efficiency."

Two complete series of experiments were made on each range, which may be generally described as (1) Physical tests; (2) Practical trials.

(This article will appear in three sections. The next division will appear in an early number.)

Conference on Stove Molding Prices to Begin December 6th.

A conference between representatives of the International Molders' Union and the stove manufacturers is to be held in Atlantic City, New Jersey, beginning on December sixth.

A number of very drastic demands have been made by the union officials and even if only a few of these are conceded there will be little or no possibility of avoiding an advance in the prices which re-

tail stove merchants and the public must pay in 1923.

Keystone State Stove Men Celebrate Silver Anniversary.

After an extended period *The Stove Salesmen's Review,* the official publication of the Stove Salesmen's Association of Pennsylvania, has made its reappearance, and promises again to be the inspirational force which has made this association one of the leading salesmen's organizations in the Keystone state.

Simultaneously, the organization laid plans to commemorate appropriately its twenty-fifth anniversary, and elected the following officers:

President—Harry E. Borzell.

First Vice-President—Harvey J. Fueller.

Second Vice-President—William H. Young.

Third Vice-President — James Black.

Secretary—James McGaw.

Treasurer—O. M. Fagley.

Secretary-Editor McGaw, in the following words, gives a brief history of the organization and its ideals, and its plans for celebrating its twenty-fifth birthday:

"In order that you may understand the significance of this occasion, it should not pass without receiving some recognition, worthy of its importance.

"The past rises before us like a dream. For those who took the initiation, not only had a vision, but a determination that the ideals which they stood for should be established.

"These, we are pleased to state, have been maintained during all these years.

"What then were these ideals? They were unselfishness! Thinking of the other fellow!

"How has it been maintained? By the fact of every member doing his part to promote harmony and good fellowship.

"While our association was instituted primarily to increase sociability among salesmen in the stove and furnace line, it did not stop there. It took on a broader view, preparing for the future.

"After becoming an incorporated body, there was introduced the insurance feature, based on the accumulation of a fund, through the assessment of members, to be paid to the beneficiary of the deceased member. Another step along the lines of progress was the putting forth of every effort to secure for the unemployed member a position. Moreover, no appeal from anyone for aid has been made which has not brought forth a liberal response.

"Do you wonder why we are proud of being affiliated with an organization which displays so broad-minded and unselfish a spirit?"

The organization planned to celebrate its anniversary with an elaborate banquet and entertainment at Hotel Walton, Philadelphia, December 13.

George H. Barbour Writes Eulogy of Frederic W. Gardner.

George H. Barbour, of the Michigan Stove Company, was associated with the late Frederic W. Gardner for more than twenty years and in the following letter gives expression to the high regard in which Mr. Gardner was held by his own business associates and by the stove manufacturers in general:

In the death of Frederic W. Gardner, which occurred on Saturday, November 11, after a protracted illness, his many friends will express a feeling of regret as amongst the stove fraternity he was as well known and as highly respected as any one engaged in the stove business. Not only myself, but every official and director of this company held him in the highest esteem.

His association with the Michigan Stove Company dates back from 1882 to 1903. Previous to his taking the position as general manager of our Chicago branch, looking after the western part of our business, he was associated with W. C. Davis & Company of Cincinnati and through his ability, this firm was put upon the map.

Since 1903, he was connected with the Buck's Stove & Range Company of St. Louis as president. Later on, deciding that he wanted to have less care, he was elected as chairman of the board which position he held up to the time of his death.

Some two years ago he decided to take up his residence at Beverly Hills, California, and has lived there quietly with his family, receiving, as I did, from time to time, letters which led me to conclude that he was in comfortable health and having a restful and enjoyable time, up to the time he was stricken.

I believe there are few, and I might say hardly any, connected with the stove business all over this country who did not know Mr. Gardner. He had a very charming personality—he made friends easily—he was a man of good business judgment—splendid sales ability, and a practical advertiser. His personality and his genial good nature won him a host of friends, and at the stove gatherings, his presence enlivened the entire situation.

He was always listened to with great interest and whatever subject he took up, he was always able to present a strong argument and customers in general had the same good feeling towards him as those who were more closely associated with him. He will be greatly missed.

Bill Habicht Joins Ranks of the Benedicts.

On the twenty-seventh day of November, William Frederick Habicht, who is well and favorably known in the stove selling circles of Pennsylvania, became the husband of Mathellen, daughter of James W. Miller, Memphis, Missouri, where the wedding ceremony took place.

The many friends of Mr. Habicht will join AMERICAN ARTISAN AND HARDWARE RECORD in wishing him and his bride all happiness and blessings.

When most people talk they waste a lot of valuable time in giving unnecessary details.

Events and Progress of the Hardware Trade.

What the Retailers, Jobbers and Manufacturers Are Doing. Latest Selling Methods and Experiences of Successful Men.

Paint Men Stamp Out Sales Fraud.

Efforts of the National Paint, Oil and Varnish Association to stamp out sales of adulterated products made under misrepresentation have been so successful that in a report presented to the recent Atlantic City convention of the organization by R. B. Robinette, of the Tropical Paint & Oil Co., Cleveland, chairman of the committee, it was stated that during the present year apparently little or no adulterated linseed oil has been offered to the public, except such as was plainly marked as adulterated. Previous to the appointment of the committee the practice of selling adulterated oil and turpentine as pure had been quite common, the report stated.

Paint manufacturers were urged to make an effort to bring about the use of better brushes in the report of the committee on allied industries. Cheap, unsuited brushes being sold by so many dealers through their ignorance of the importance of the brush in proper application is responsible for many nonsuccessful paint or varnish jobs, and restrict greater consumer demand for such products, the paint manufacturers were told.

Today finds practically every brush factory running to capacity, the committee reported, the increasing consumption of paint and varnish demanding tools for their application. With little difficulty in securing raw materials and increasing demand for its output, the brush industry is in a satisfactory condition.

Louis R. Atwood, of the Peaslee, Gaulbert Co., of Louisville, was elected president of the National Paint, Oil and Varnish Association. The following vice-presidents were elected: For the Eastern Zone, E. V. Peters, New York; Central Zone, J. W. Bray, St. Louis; Western Zone, Sidney Rasmussen, Portland, Oregon; Southern Zone, H. J. Kuhn, Houston; Canada, George Henderson, Montreal; treasurer, John H. Pine, Chicago.

Propose Building for Housing Hardware Trade in Chicago.

American Artisan and Hardware Record is in receipt of the prospectus of the North Pier Terminal Company to erect a warehouse building of ten stories and basement, containing 2,000,000 feet of floor space—about 50 acres—in which the hardware trade of Chicago would be housed under one roof.

The suggested location is three blocks east of Michigan boulevard on East Illinois street, ten minutes' walk from the "Loop." The enumerated objects of the proposed structure are:

To locate the hardware specialty manufacturers under one roof, and combine their offices and salesrooms, with stock room and shipping room space in the same building.

To facilitate the distribution of merchandise of those hardware manufacturers who use Chicago as their distributing point, and to demonstrate to those who do not use her wonderful shipping facilities that it will pay them to locate here.

To simplify the purchasing of out-of-town buyers.

To cheapen the freight rates to buyers by combining purchases into car lots, where possible, without expense of teaming or extra handling charges.

To reduce the manufacturer's costs, by our handling all his shipping, both in and out.

To eliminate or greatly reduce teaming and its high costs to railroads.

To give Eastern hardware manufacturers the benefit of lake and rail differential rates, as the building has dock facilities.

To make this building the United States headquarters of the hardware manufacturing trade and a meeting place for their conventions.

To lessen cost of Chicago buyers by enabling them to collect their goods from one place.

Last, but not by any means the least, the great saving in rent to our tenants. The space will cost from one-half to two-thirds less than space in the "Loop."

The North Terminal Pier Company now are operating, directly across the street, the largest warehouse under one roof in the United States.

Waukegan Manufacturer Moves to Freeport, Changes Name.

Announcement is made of the removal from Waukegan to Freeport, Illinois, of the Waukegan Manufacturing Company, and of the change of the firm name to the W. E. Kautenberg Company.

The concern makes a complete line of mop handles with metal holders attached, and also offers to the trade quotations on handles used for brooms, oil mops, etc.

See How Other Fellow Does Things—And Do it Better.

To keep alive to the methods of merchandising a certain merchant makes it his business every year to pay several visits to various stores about which he has heard or read about. When he enters a new store, he notices the impression he gets, the methods of display, the organization of the employes, the selling stunts, and other things. In this way, he receives many of the valuable ideas which have brought results in his own store. His motto is: "See how the other man does it and do it better."

Suggestions and Plans for Window Displays.

Instructive Examples from Exhibits in AMERICAN ARTISAN AND HARDWARE RECORD Window Display Competition.

Artistic Sports Goods Display Brings Sales.

All window trimmers strive for the artistic; some attain it.

The expression of the street that "Miss Blank is certainly easy to look at" has sound psychological basis. The perfect window display must first of all be "easy to look at." It is an effect which many gifted window designers reach without knowing just why. Nor need they be concerned, for they are sufficiently fortunate in having this gift.

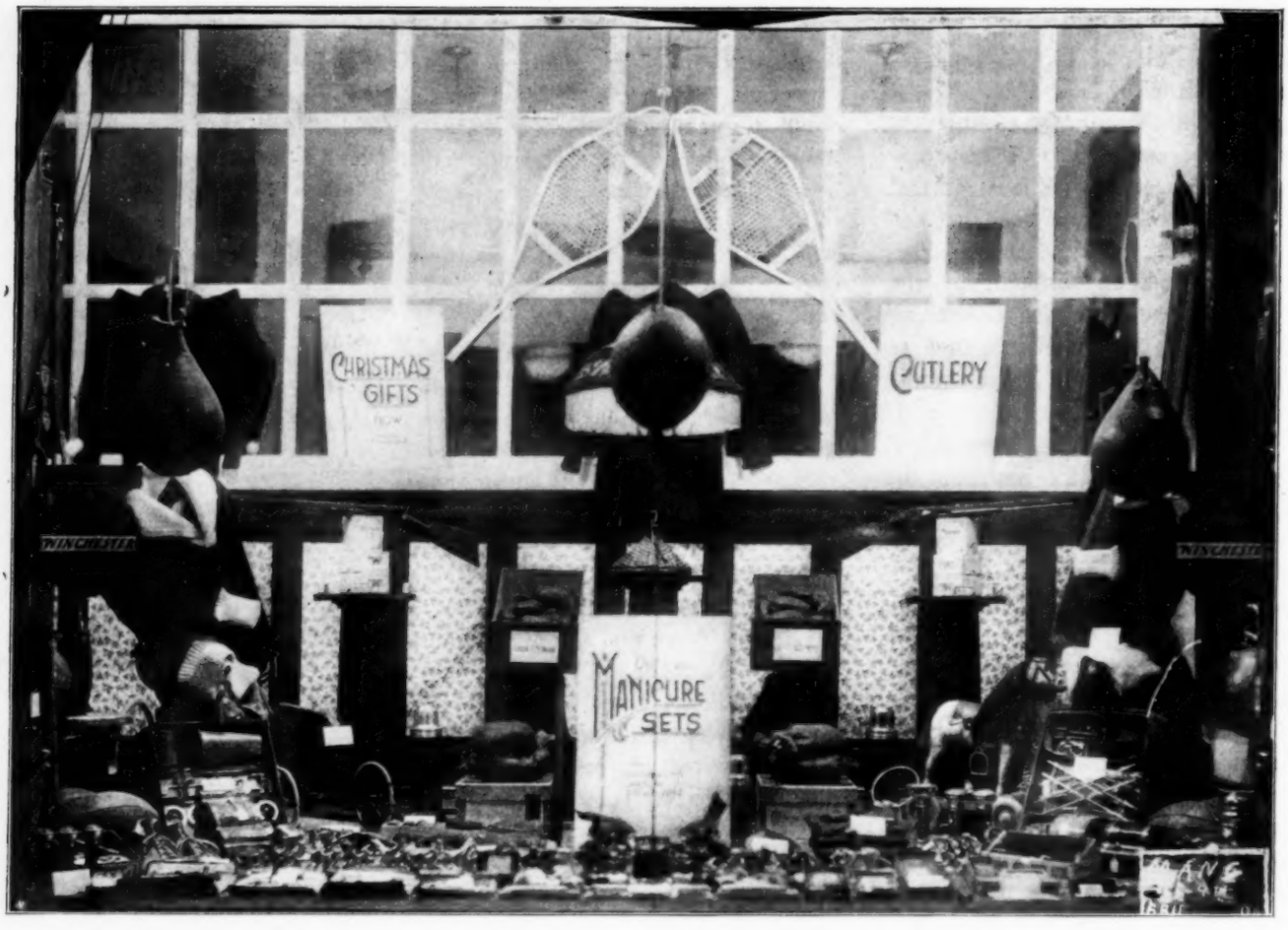
There is a material and practical side in striving for the artistic in window dressing, for the result is to sell goods, as testified to by H. W. Goeller, manager of The Sport Store, Erie Pennsylvania, whose window creation is reproduced herewith.

There can be little doubt that Mr. Goeller's window display is "easy to look at." Observe, first of all, the grill and panel work, which furnish the necessary "background" — as necessary to the window display as to the canvas of the painter. There undoubtedly was great temptation to make use of the desirable space left exposed on the upper background, and Mr. Goeller has shown admirable restraint. Mr. Goeller must have realized that to clutter up these spaces with other goods would have been to confuse the eye and thus detract from the merchandise he seeks to *sell* and which is placed in the foreground.

It will be noted that the effect of "balance" is achieved by the pair of snowshoes in the center; the electric lamp in center; the punching bags—one in center and one to right and left, and the pedestals in the rear in the same position.

The larger articles are, of course, placed in the rear, but it should be observed what a wealth of articles are to be found in the near foreground. These are not to be recognized in the published reproduction, but it must be undisputed that they were the objects of scrutiny by the passing Christmas shoppers.

Note the three advertising cards, which, while not necessary to the display, add materially to its effectiveness, being artistically typed,



Christmas Window Merchandising Design by H. W. G oeller, Manager The Sport Store, Erie, Pennsylvania.

and two of them giving concrete buying suggestions.

"This sport window brought us a lot of business for the holidays," writes Mr. Goeller.

How to Look on Your Window as an Advertiser.

Merchants should look upon their window displays as expensive full-page advertisements in a newspaper whose circulation consists of all the people who pass the store.

This striking observation is made in a special article, entitled "Make Your Windows Work," appearing in an interesting 16-page booklet being circulated and distributed to the trade by The Smith & Hemenway Company, Inc., 261 Broadway, New York City. The title of the booklet is "Helping the Hardware Dealer Sell," and it follows, in part:

Your greatest opportunity to do sales creating advertising lies in the use to which you put your windows. They form a direct and personal appeal to your prospective customers at the most favorable time.

If you use your windows merely as an extra place to keep stock; if they are dirty or untidy, or if your displays are haphazardly thrown together, you might just as well keep your shades drawn all the year round for all the good your windows will do you.

Look upon your windows as expensive full-page advertisements in a newspaper whose circulation consists of all the people who pass your store. You have the advantage of using as many colors as you like in these advertisements, and you are not limited with regard to the number of illustrations.

The advertising man who had these opportunities would make mighty good use of them, and so can you, if you will follow the suggestions contained in this article.

In the first place you must have a central idea or plan around which to build your window display. Always remember that the unified display is the most effective. This does not mean that you can only show one line of goods, but it does mean that all goods you show should bear some relation to the main idea.

You might have a "Clean Up" trim, in which vacuum cleaners, brooms, pails, and other articles used in housework could be displayed. You might try a "Save the Surface and You Save All" window, featuring paints, brushes and things of that description. Another excellent idea is to make a trim entirely of one manufacturer's goods.

When you have decided upon the main theme for your display, your next job is to trim the window in the way that will bring out the big idea most effectively. We are not going to give any detailed instructions along these lines, for, after all, individuality is half the battle in making window displays pull; but if you will keep the following points in mind you should experience no difficulty in trimming windows that will sell goods.

Change your window displays as often as you can, and give everything in the store a chance to get in the window, at some time or other.

Don't use slovenly written show cards, or dirty or bent price tickets. It pays to keep them clean and attractive. And don't be afraid to buy new ones occasionally—it will be money well invested.

Make the windows as attractive as possible. Arrange the various items so that they will catch the eye. Streamers, unusual color combinations, and moving signs, are all valuable for this purpose.

Don't overcrowd the window. Bear in mind that people don't stop and survey windows for any considerable length of time, as a rule. Your aim is to arrest the attention of the casual passer, and the fewer the items in the display, the more likely are you to do so.

Above all—keep the windows clean and the paint and varnish fresh. If you use draperies, renew them often, and see to it that the metal parts of the window are polished regularly. A hardware dealer should be particularly careful about these points, for the same reason that a druggist should keep his store sanitary—the very nature of the goods he sells, demands it.

Finally, keep a careful record of the pulling power of each display you use, it will help you considerably when planning future trims. You should keep on file the date of the display; the type or central idea (actual photographs are useful for this purpose) and—most important of all—the number and value of the various items you featured, that were sold during the time the display was in the window.

"Automotive Christmas" Ideas Apply Also to Hardware.

"Make It An Automotive Christmas" is the suggestion of the Automotive Equipment *Merchandiser*, the official publication of the salesmen members of the Automotive Equipment Association. The ideas outlined seem so timely, and in many instances are equally applicable to hardware articles, that we are glad to review the plan.

The *Merchandiser* sets out that the automobile owners of the country have by far the major buying power of the nation, and further that there has been a steady yearly trend for the selection of "Gifts of Utility," and that it is now up to the dealer to "Ask 'Em to Buy" and capitalize on this trend. Then these concrete suggestions are made by the industry in the dealers' behalf:

As a starter, the A. E. A. printed all the Christmas information it could get last September. As a result, several manufacturers of saleable articles are putting their goods in Christmas wrappers or are putting Christmas paper and stickers in with their carton shipments.

A number of jobbers have made arrangements to supply their dealers with holiday wrapping paper and string at cost or no cost, for the big essential is that THE GOODS MUST BE MADE TO LOOK LIKE CHRISTMAS PRESENTS. This means some kind of wrapper. Paper can be secured in any town in case it isn't otherwise sent to the dealer.

Some jobbers have printed 11x14 cards for their dealers, urging the public to come in and look over their Christmas gifts. The slogan

is, "Give Automotive Gifts for Christmas."

The A. E. A. distributed to those members who applied for them 400,000 stickers in October, which said, "Automotive Equipment has made more money for hundreds of dealers. Ask the jobber's salesman." In November there are being distributed in the same way 500,000 stickers, which said, "A big chance for profits and we've all been passing it up. Automotive Gifts for Christmas. Ask the jobber's salesman." In December a third Christmas sticker will go out to the number of a half million or more.

These stickers, about 1½ x 2, are stuck on letters which go from A. E. A. members to dealers. The idea is to arouse the dealer's interest and pave the way for the salesman to talk with him about the idea. In many cases the dealer will be prompted to ask for information from the salesman, all of which makes it easier for the salesman to get in and tell the story of merchandising.

Salesmen are reminded that it can be made an "Automotive Christmas," with a month to do it in, if manufacturers, jobbers and salesmen get behind the idea and each give it a push.

Coming Conventions

Western Warm Air Furnace and Supply Association, Annual Meeting, Hotel Sherman, Chicago, Illinois, December 6, 1922. John H. Hussie, Secretary, 2407 Cuming Street, Omaha, Nebraska.

Western Implement and Hardware Association, Kansas City, Missouri, January 16, 17, 18 and 19, 1923. Exhibition in Convention Hall. H. J. Hodge, Secretary, Abilene, Kansas.

Texas Hardware and Implement Association, Dallas, Texas, January 23, 24 and 25, 1923. A. M. Cox, Secretary, 822 Dallas County Bank Building, Dallas, Texas.

Mountain States Hardware and Implement Association, Denver, Colorado, January 23, 24 and 25, 1923. W. W. McCallister, Secretary-Treasurer, Boulder, Colorado.

Kentucky Hardware and Implement Association and Exhibition, Jefferson County Armory, Louisville, Kentucky, January 23, 24, 25 and 26, 1923. J. M. Stone, Secretary, Sturgis, Kentucky.

West Virginia Hardware Association Convention and Exhibition, Huntington, West Virginia, January 30 and 31, and February 1, 1923. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

South Dakota Retail Hardware Association, Sioux Falls, South Dakota, January 16, 17, 18 and 19, 1923. H. O. Roberts, Secretary, 1120 Metropolitan Life Building, Minneapolis, Minnesota.

Idaho Retail Hardware and Implement Dealers' Association, Boise, Idaho, January 31, February 1 and 2, 1923. E. E. Lucas, Secretary, Hutton Building, Spokane, Washington.

Indiana Retail Hardware Association Convention and Exhibition, Indianapolis, Indiana, January 30 and February 1 and 2, 1923. G. F. Sheely, Secretary, Argos, Indiana.

Oklahoma Hardware and Implement Association, The Auditorium, Oklahoma City, Oklahoma, January 31, February 1, 1923. W. A. Clark, Secretary-Treasurer, 209½ West Main Street, Oklahoma City, Oklahoma.

Nebraska Retail Hardware Association, Convention and Exhibition, February 6 to 9, 1923, Omaha, George H. Dietz, Secretary-Treasurer, 414 Little Building, Lincoln, Nebraska.

Michigan Retail Hardware Convention and Exhibition, Grand Rapids, February 6, 7, 8, 9, 1923. Karl S. Judson, Exhibit Manager, 248 Morris Avenue, Grand Rapids. A. J. Scott, Secretary, Marine City, Michigan.

Virginia Retail Hardware Association, Norfolk, Virginia, February 7, 8 and 9, 1923. Thomas B. Howell, Secretary, Richmond, Virginia.

Wisconsin Retail Hardware Association, Milwaukee Auditorium, Milwaukee, Wisconsin, February 7, 8 and 9, 1923. P. J. Jacobs, Secretary, Stevens Point, Wisconsin. George W. Kornley, Manager of Exhibits, 1476 Green Bay Avenue, Milwaukee, Wisconsin.

Pennsylvania and Atlantic Seaboard Hardware Association Convention and Exhibition, Philadelphia Commercial Museum, Philadelphia, Pennsylvania, February 12, 13, 14, 15 and 16, 1923. Sharon E. Jones, Secretary, 1314 Fulton Building, Pittsburgh, Pennsylvania.

Ohio Hardware Association Convention and Exhibition, Cleveland, Ohio, February 13, 14, 15 and 16, 1923. Exhibition in the new Municipal Hall. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Illinois Retail Hardware Association Convention and Exhibition, Hotel Sherman, Chicago, Illinois, February 13, 14 and 15, 1923. L. D. Nish, Secretary-Treasurer, Elgin, Illinois.

Iowa Retail Hardware Association Convention and Exhibition, Des Moines, Iowa, February 13, 14, 15 and 16, 1923. A. R. Sale, Secretary, Mason City, Iowa.

North Dakota Retail Hardware Association, Grand Forks, North Dakota, February 14, 15 and 16, 1923. C. N. Barnes, Secretary, Grand Forks, North Dakota.

Missouri Retail Hardware Association Convention and Exhibition, Planters Hotel, St. Louis, Missouri, February 20, 21 and 22, 1923. F. X. Becherer, Secretary, 5106 North Broadway, St. Louis, Missouri.

Minnesota Retail Hardware Association, Duluth, Minnesota, February 20, 21, 22 and 23, 1923. H. O. Roberts, Secretary, 1120 Metropolitan Life Building, Minneapolis, Minnesota.

New England Hardware Dealers' Association Convention and Exhibition, Mechanics' Building, Boston, Massachusetts, February 21, 22 and 23, 1923 George A. Fiel, Secretary, 10 High Street, Boston, Massachusetts.

New York State Retail Hardware Association Convention and Exposition, Rochester, New York, February 20, 21, 22 and 23, 1923. Headquarters, Powers Hotel. Sessions and Exposition at Exposition Park. John B. Foley, Secretary, City Bank Building, Syracuse, New York.

Michigan Sheet Metal and Roofing Contractors' Association, Bay City, February 26, 27, 28 and March 1, 1923. Frank E. Ederle, Secretary. 1121 Franklin Street, S. E., Grand Rapids, Michigan.

American Hardware Manufacturers' Association, Spring Convention, Windsor Hotel, Jacksonville, Florida, April 24, 25, 26 and 27, 1923. Frederick D. Mitchell, Secretary - Treasurer, 1819 Broadway, New York City.

Southern Hardware Jobbers' Association, Windsor Hotel, Jacksonville, Florida, April 24, 25, 26 and 27, 1922. John Donnan, Secretary-Treasurer, Richmond, Virginia.

Old Guard Southern Hardware Salesmen's Association, Windsor Hotel, Jacksonville, Florida, April 25, 1923. R. P. Boyd, Secretary-Treasurer, R. F. D. 4, Knoxville, Tennessee.

Hardware Association of the Carolinas, Columbia, South Carolina, May 8, 9, 10 and 11, 1923. T. W. Dixon, Secretary-Treasurer, Charlotte, North Carolina.

Arkansas Retail Hardware Association, May, 1923. (Place to be announced later.) L. P. Biggs, Secretary, 815-816 Southern Trust Building, Little Rock, Arkansas.

National Retail Hardware Association, Richmond, Virginia, June, 1923. Herbert P. Sheets, Secretary-Treasurer, Argos, Indiana.

Southeastern Retail Hardware and Implement Association, covering Tennessee, Alabama, Georgia and Florida. (Date and place to be announced later.) Walter Harlan, Secretary-Treasurer, 701 Grand Theater Building, Atlanta, Georgia.

Retail Hardware Doings

Illinois.

P. A. Covert, who for the past four years has conducted a hardware and implement store at Sublette, has moved to Dixon, where he will engage in the same business.

A. Bradshaw of Somonauk has bought out a hardware store at Compton.

Indiana.

Jacob Life has purchased The Huffman Hardware store at Portland.

Iowa.

The N. R. Groff Hardware Company of Decorah have moved to West Union in the Hoyt Building.

Gus Ehlers has opened a modern and complete hardware store at Clinton.

Michigan.

The Myrtle Hardware and Supply Company has opened at 2051 Myrtle Street, Detroit.

Minnesota.

Tanner Brothers Hardware stock at Fairmount has been sold to Houghtaling and Coult and the Siehl Hardware Company.

Edward Hose and Ben Sucker have taken over the Hose Hardware store at Sleepy Eye.

Study and Interpretation of Advertisements.

You Can Make Your Advertisements More Gainful by Avoiding the Faults and Profiting by the Good Qualities of Others.

Here is another example of linking up local retailing with manufacturers' merchandising.

By adding their own name-plate, "Mohr-Jones, Racine's Leading Hardware Store," have complied with the advertising suggestion prepared by the manufacturer, reproduced here as it appeared in the Racine, Wisconsin, *Journal*.

In this case the manufacturer is the maker of the Apex Treasure Chest, and the ad is built around the Apex Treasure Chest, which is a children's dime-bank built in replica of the washer.

This unique device, with the suggestion of its big original, is thus sure to go into the home—the kiddies will see to that. Good leads and prospects are sure to result.

* * *

Undoubtedly, the cross-bladed knife of the Crisman Hardware Company is well known in Chattanooga, Tennessee. If it were not, that concern would not consider it so important as to give it the feature position in its six-inch ad. Many might think either this space or that which the company devotes to repeating its name could have been better expended in saying something more about the stoves and in quoting a price or two. However, the advertisement is timely and the line "heating stoves to burn" has a humorous twist which ought to establish that much-sought personal relation between advertiser and buyer.

Pirate Treasure Days Are Past, Boys and Girls!

Here Is the Apex Treasure Chest

A handsome little savings bank, made just like the Apex Electric Washer. This bank will be given away FREE to boys and girls who embark on this expedition.

BUT there are still treasure chests to be found—and right in your own neighborhood. Real gold that's all yours if you will only dig for it!

We have a business proposition to make to you that will test your mettle—a little adventure in "treasure seeking." There's money in it for you—as much as one hundred dimes—and a nice little bank, FREE, in which to lock your spoils. Think of all the things you can buy with one hundred dimes! Do as Carnegie, Rockefeller and other rich men did when they were young—earn and save! That's the way to wealth—and all the good things it brings. Come in and see us about this. Ask for "the Captain."

MOHR-JONES

RACINE'S LEADING HARDWARE STORE

313-15-17-19 Sixth Street

HEATING STOVES TO BURN

See our line of HEATERS before you buy.

HARNESS HARDWARE CRISMAN

CRISMAN Hardware Co.

511 MARKET ST.

"Look for the Big Knife"

Review of Conditions in the Metal Markets.

General Situation in the Steel Industry. Report of Prices and Tendencies in Sheet Metals, Pig Iron, etc.

Non-Ferrous Metals Market Steady, Prices Unchanged.

The non-ferrous metals market remained practically unchanged throughout the week. Copper was quiet with electrolytic spot and futures being quoted at 13⅞ to 14 cents. Tin was weak with closing quotations for spot and futures being at $36.00. Lead was steady, with spot deliveries at 7.10 to 7.35 cents. Zinc was steady with East St. Louis, spot and nearby delivery, being quoted at 7.00 to 7.10 cents.

Copper.

Buying of copper by domestic consumers continues very moderate. A few orders for relatively small lots were placed at 14 cents delivered but electrolytic is still available to important domestic consumers at 13⅞ cents delivered.

A steady increase in production encourages consumers to believe that within a few months output will have overtaken consumption. Under such prospects there is little to alarm consumers in regard to prices in the near future. The fact that deliveries into domestic and foreign consumption last month exceeded refined production by 30,000,000 pounds, of course, further increased the strength of the statistical position.

It is doubtful, however, that deliveries in November and December will maintain this unprecedented movement into consumptive channels and this could hardly be expected even by producers. The notable point is that production continues to increase.

Business in the outside market continues very quiet. There are only a few inquiries from consumers. Offerings are relatively small but it is possible to shade producers' prices five to ten points on firm bids, so far as electrolytic is concerned. Lake copper is less active but steady at 14 cents delivered for nearby delivery. Electrolytic is held at 13⅞ cents f. o. b. refinery and casting is steady at 13.40 cents f. o. b. refinery. There is very little interesting being displayed in future positions that is for either first or second quarter of next year, but prices are without essential change.

Zinc.

The zinc market recovered after falling off at the end of last week, the half cent decline to 6.85 to 6.90 cents being more than made up. Zinc slab was firm at East St. Louis, closing at 7.10 cents.

There was a steadier tendency at the close, however, producers being unwilling to do any further shading, although bids continued mostly well under the market. Galvanizers are not entirely optimistic over the outlook for over the winter, as their supplies are sizable and orders have not been running very heavy. The fact that the Steel Corporation will accept orders for galvanized sheet over the first quarter of 1923 at present prices has been a disappointing development to the trade.

The domestic market is still following the foreign leading. No active buying is reported from that direction today, but sellers are evidently hopeful of its recurrence and are reticent in their offerings of zinc.

Lead.

The closing New York quotation for lead was 7.00 to 7.10 cents, with the market steady, and the same condition prevailing at East St. Louis, with the price firm at 7.00 cents.

Demand for lead has been good and the market was firm, the feature being an advance for the twenty-second consecutive time by the American Smelting & Refining Company. The price was first advanced by the company in September, 1921, from 4.40 to 4.45 a pound, and it has risen without a reaction to the present level of 7.10 a pound.

There has been no appreciable slackening of trade, but on the other hand demand continues in excess of consumption. Good orders for delivery as far ahead as February were received in the market last week.

Solder.

Chicago warehouses quoted solder prices as follows: Warranted, 50-50, per 100 pounds, $24.00; Commercial, 45-55, per 100 pounds, $22.50; and Plumbers', per 100 pounds, $21.25.

Tin.

The tin market throughout the week was consistently weak, closing at $36, which followed last week's easing off of about one-half cent per pound.

The London market was off £3 for the week, but the effect on the New York market was somewhat offset by higher sterling exchange. Domestic demand for tin was quiet, with buyers indisposed to pay the 36⅛ cents asked for spot Straits, and 36⅜ cents for forward deliveries.

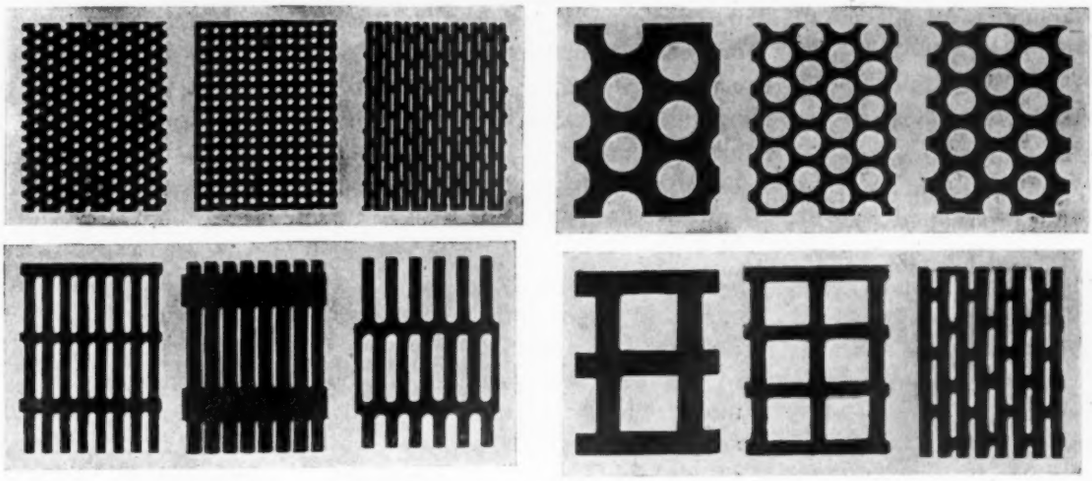
It is estimated that American deliveries for November will be between 4,500 and 5,000 tons. Total supplies for the month will be about 7,600 tons, provided 875 tons due to arrive are landed.

Bolts and Nuts.

Bolt, nut and rivet orders in the Cleveland and Pittsburgh districts are reported fair, but in the Chicago territory, although the situation continues satisfactory to producers, a definite falling off of specifications against contracts has been noted in the past few days.

Producers still are operating their plants at as high a rate as possible under present conditions of material supply and are not worried at the change in demand. With last quar-

PERFORATED METALS



PERFORATED STEEL—COPPER—BRASS—BRONZE—ALUMINUM—ZINC—TIN PLATE and all other metals.
For Sreening and Sizing STONE—GRAVEL—SAND—COAL—all minerals—GRAIN and anything to be screened.
For DRYING FLOORS AND DECKS—VENTILATORS—DRAINS—ETC.
GRILLES—REGISTER FACES and ORNAMENTAL SCREENS.

Perforated Tin and Brass always in stock.

THE HARRINGTON & KING PERFORATING CO.

610 NORTH UNION AVE., CHICAGO, ILL., U. S. A.
NEW YORK OFFICE, 114 LIBERTY ST.

Sheets
—SPECIAL—

400 Squares No. 26
Galvanized Corrugated
8′ 0″ and 10′ 0″ Lengths

$4.10 Per Square

THIS is all prime quality and can be 2½″ or 1¼″ corrugations—immediate shipment from Chicago.

Send for our Special Stock List of bargains in black sheets.

THE SYKES COMPANY

2264 West 58th Street,
Chicago, Ill.

INLAND
COPPER ALLOY SHEETS

REDUCE SHOP COSTS

Increase the Life of

Furnaces, Tanks, Roofs and Ventilators

INLAND
BASIC OPEN HEARTH
STEEL PRODUCTS

INLAND STEEL COMPANY
38 South Dearborn St. :: :: Chicago

Works:
Indiana Harbor, Ind.
Chicago Heights, Ill.

Branch Offices:
Milwaukee St. Louis
St. Paul

ter more than half gone, the present falling off in specifications is taken as a temporary lull which will be replaced shortly by a rush of business to clean up before the end of the year. Prices remain steady.

Nails and Wire.

Wire mills in the Chicago district are mostly interested in delivery, except for the problem of increasing production. With plants operating about 65 per cent it has been impossible to meet requirements of delivery and users of wire and nails are using every effort to obtain larger shipments.

Inasmuch as there are no mill stocks and comparatively little in the hands of jobbers, demand is reflected immediately to the mill. Inquiry is heavy in practically all lines. Sales of woven wire fence for spring delivery are being made steadily and this department promises to be covered promptly.

Weather conditions have cut down on roofing operations.

Tin Plate.

The outstanding development of the week's tin plate market was the announcement of the American Sheet and Tin Plate Company, subsidiary of the United States Steel Corporation, that its prices for first quarter delivery, 1923, of tin plate would remain the same to manufacturers and jobbers. The "official" quotation on tin plate, Pittsburgh base, is $4.75 a base box.

Sheets.

The prices of the American Sheet and Tin Plate Company for the opening quarter for the new year stand the same as previously. The present prices on sheets are as follows: Black 3.35, galvanized 4.35 and blue annealed 2.50 cents a pound base Pittsburgh, while the "official" quotation on tin plate is $4.75 a base box Pittsburgh.

The trade has been eagerly awaiting these prices for several weeks now and the bulk of pending business in sheets has been held up by the delay in the announcement. At first an advance was anticipated owing to the higher costs of production and the fact that the independents were receiving premiums over and above the base prices of the corporation, but as time wore on and transportation conjection became relieved somewhat, these premiums for prompt delivery gradually disappeared. It was then seen that higher prices were impossible and the continuation of the present base has been freely predicted for some days.

Higher wages amounted to a 20 per cent increase effective the first of last September was one of the most serious factors militating against lower prices, and this was plainly disclosed in the immediate drop in earnings of the leading interest which totaled only $7,727,721 in September, as against $11,324,059 in August.

Old Metals.

Wholesale quotations in the Chicago district which should be considered as nominal are as follows: Old steel axles, $18.00 to $18.50; old iron axles, $24.50 to $25.00; steel springs, $20.50 to $21.00; No. 1 wrought iron, $18.00 to $18.50; No. 1 cast, $16.00 to $16.50, all per net tons. Prices for non-ferrous metals are quoted as follows, per pound: Light copper, 9 cents; light brass, 5 cents; lead, 4¾ cents; zinc, 3¾ cents; and cast aluminum, 14 cents. The demand for nearly all lines is heavy.

Pig Iron Buying Again Active as Melters Realize Conditions of Depleted Stocks.

Boom Market, Particularly in Foundry Iron, Is Seen for First Quarter of 1923.

THE continued increase in production of iron and steel products, together with a new interest and activity on the part of buyers, reflected conditions in the week's iron and steel market. With Chicago prompt iron at $29, conditions locally mirrored the drop.

The high rate of steel works and rolling mill operations has kept up for another week and the industry is exceeding the predictions of early October in the rate at which it is working up accumulated orders.

The subsidence of recent unfounded reports of impending wage increases accompanies an easier situation as to common labor supply. Besides 9,000 more freight cars bought at Chicago, new inquiries have appeared for 1,250 cars.

Pig iron buying is active. All grades are in demand, with foundry leading. Orders running well into the thousands of tons at published prices are numerous, not only for immediate delivery but for the first quarter and some throughout the first half of 1923. The famished condition of foundry stocks is apparent from the urgent demands made for prompt shipment at this time when every one is anxious to have the smallest inventories possible. This inventory deterrent will soon be entirely removed and further impetus will be added to purchases and demands for shipment.

The ruling prices are low, in most instances dollars below cost, but furnaces are encouraged to believe that this renewed activity indicates the buyers' conviction that the bottom has been reached.

In spite of the fact that during the past few months' production has made heavy gains, the present melt is absorbing it readily. With foundries looking forward to greater activity after January 1st, many of those in close touch with the industry anticipate a tight pig iron market for 1923.

There is practically no change in the coke situation. It is still possible to secure prompt shipment of most of the better known brands of foundry fuel at attractive prices. Orders are chiefly confined to early needs. Comparatively little contracting for 1923 has been done.

REQUIRES ONLY HEAT

CHICAGO SOLDER COMPANY
4201 Wrightwood Ave., CHICAGO, ILL.

RIGID | EFFICIENT | STRONG

AREX
VENTILATOR

A SIPHONAGE principle ventilator assuring natural, even exhaust.

The Arex does the work of three ordinary ventilators. Never fails to satisfy in operation and lasting qualities.

AREX
VENTILATOR

Here is a money maker for you. Reasonably priced to give you a good profit. Easy to install—has no movable parts—is stormproof, rigid and extraordinarily strong. Write today and let us send you our latest catalog and price list.

AREX COMPANY
111 WEST WASHINGTON STREET
CHICAGO, ILLINOIS

Memorial Monuments

Write for Prices and Illustrations

Gerock Bros. Mfg. Co.

Sheet Metal Ornaments and STATUARY

1252 So. Vandeventer Ave.

St. Louis, Mo., U. S. A.

CORTRIGHT METAL SHINGLES

When it comes to Galvanized Shingles, use Cortright Hand Dipped. They are first formed of prime roofing tin, and then coated separately in a zinc bath, receiving a heavy coating on both sides.

Cortright Metal Roofing Co.

Philadelphia — Chicago

Lupton

Elbows, Conductor Pipe, Eave Trough, Etc.

The superiority of Lupton's Products has been established on the solid basis of quality.

Lupton's Elbows are machine made, in one piece; hence they never vary in size, girth or shape. A replacement is as easy to do as a new job.

The conductor pipe is made full girth, with an ample seam that is tightly locked and sets flat on the back of the pipe.

There's no obstruction in the bead of Lupton's Eave Trough; the connection is easily made.

The use of Lupton's Products saves time and labor and produces a better job.

Made from Armco Iron, Toncan Metal, Horse Head Zinc, galvanized steel, copper and Follansbee's Security H. O. H.

Order from your Jobber or write for our new catalogue and list prices.

David Lupton's Sons Company
Allegheny Avenue and Tulip Street
Philadelphia

Lupton

"Lupton Elbows FIT"

Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

PIG IRON.

Chicago Foundry	30 00
Southern Fdy. No. 2	29 01 to 30 01
Lake Sup. Charcoal	36 15
Malleable	30 00

FIRST QUALITY BRIGHT TIN PLATES.

		Per Box
IC	14x20 112 sheets	$10 00
IX	14x20	11 25
IXX	14x20	12 60
IXXX	14x20	13 90
IXXXX	14x20	15 25
IC	20x28	20 00
IX	20x28	22 50
IXX	20x28	25 20
IXXX	20x28	27 80
IXXXX	20x28	30 50

COKE PLATES.

Cokes, 180 lbs.	20x28	$11 80
Cokes, 200 lbs.	20x28	12 00
Cokes, 214 lbs. IC	20x28	12 35
Cokes, 270 lbs. IX	20x28	14 10

BLUE ANNEALED SHEETS.

Base ..... per 100 lbs. $4 00

ONE PASS COLD ROLLED BLACK.

No. 18-20 per 100 lbs.	$4 65
No. 22-24 per 100 lbs.	4 70
No. 26 per 100 lbs.	4 75
No. 27 per 100 lbs.	4 80
No. 28 per 100 lbs.	4 85
No. 29 per 100 lbs.	4 95

GALVANIZED.

No. 16 per 100 lbs.	$5 10
No. 18-20 per 100 lbs.	5 25
No. 22-24 per 100 lbs.	5 40
No. 26 per 100 lbs.	5 55
No. 27 per 100 lbs.	5 70
No. 28 per 100 lbs.	5 85
No. 30 per 100 lbs.	6 35

BAR SOLDER.

Warranted.

50-50 ..... per 100 lbs. $24 00

Commercial

45-55 per 100 lbs.	22 50
Plumbers .... per 100 lbs.	21 25

ZINC.

In Slabs 8 25

SHEET ZINC.

Cask lots, stock 10¼c
Less than cask lots 10¾c

COPPER.

Copper Sheets, base 21¼c

LEAD.

American Pig	$ 7 75
Bar	8 50

Sheet.

Full coils .... per 100 lbs.	10 00
Cut Coils ..... per 100 lbs.	10 25

TIN.

Pig Tin ..... per lb.	38½c
Bar Tin	41c

HARDWARE. SHEET METAL SUPPLIES, WARM AIR HEATER FITTINGS AND ACCESSORIES.

ADZES.

Coopers'.
Barton's ..... Net
White's ..... Net

AMMUNITION.

Shells, Loaded, Peters.
Loaded with Black Powder 18%
Loaded with Smokeless Powder 18%
Winchester.
Smokeless Repeater Grade ..... 20 & 4%
Smokeless Leader Grade ..... 20 & 4%
Black Powder ..... 20 & 4%
U. M. C.
Nitro Club ..... 20 & 4%
Arrow ..... 20 & 4%
New Club ..... 20 & 4%
Gun Wads—per 1000.
Winchester 7- 8 gauge 10&7½%
" 9-10 gauge 10&7½%
" 11-28 gauge 10&7½%

ASBESTOS.

Paper up to 1/16 ..... 6c per lb.
Rollboard ..... 6¼c per lb.
Millboard 3/32 to ⅛ ..... 6c per lb.
Corrugated Paper (250 sq. ft. to roll) .... $6.00 per roll

AUGERS.

Boring Machine ..... 40&10%
Carpenter's Nut 50%
Hollow.
Stearns No. 4, doz. $11 50
Post Hole.
Iwan's Post Hole and Well 35%
Vaughan's, 4 to 9 in. $15 60

AWLS.

Brad.

No. 3 Handled	per doz.	$0 65
No. 1050 Handled	"	1 40
Patent asst'd, 1 to 4	"	35

Harness.

Common	per doz.	$1 05
Patent	"	1 00

Peg.

Shouldered	"	1 60
Patented	"	75

Scratch.
No. IS. Socket Handled ..... per doz. $2 50
No. 344 Goodell-Pratt, list less 35-40%
No. 7 Stanley ..... per doz. $2 25

AXES.

First Quality, Single Bitted (unhandled), 3 to 4 lb., per doz. $12 00
Good Quality, Single Bitted, same weight, per doz. 11 00

BALANCES, SPRING.

Universal.
Sight Spring ..... List less 25%
Straight ..... List less 25%

BARS, CROW.

Steel, 4 ft., 10 lb. ..... $ 80
Steel, 5 ft., 18 lb. 1 40
Pinch bars, 5½ ft., 24 lb. 1 60

BARS, WRECKING.

V. & B. No. 12	$0 34
V. & B. No. 24	0 43
V. & B. No. 324	0 57
V. & B. No. 30	0 48
V. & B. No. 330	0 63

BEVEL, TEE.

Stanley's Rosewood handle, new list ..... Nets
Stanley iron handle ..... Nets

BINDING CLOTH.

Zinc 55%
Brass 40%
Brass, plated 60%

BITS.

All Vaughan and Bushnell.

Screw Driver, No. 30, each	$ 27
Screw Driver, No. 1, each	16
Reamer, No. 80, each	41
Reamer, No. 100, each	41
Countersink, No. 13, each	20
Countersink, Nos. 14-15 each	27

BLADES, SAW.

Wood.
Atkins 30-in.

Nos.	6	40	26
	$8 90	$9 45	$5 40

BLOCKS.

Wooden 45%
Patent 45%

BLOW TORCHES (See Firepots).

BOARDS.

Stove.	Per Doz.
26x26, wood lined	$14 45
28x28, " "	16 95
30x30, " "	19 00
26x26, paper lined	8 15
28x28, " "	9 10
30x30, " "	10 80
Wash.	
No. 760, Banner Globe (single) ..... per doz.	$5 25
No. 652, Banner Globe (single) ..... per doz.	6 75
No. 801, Brass King, per doz.	8 25
No. 860, Single—Plain Pump	6 25

BOLTS.

Carriage, Machine, etc.
Carriage, cut thread, ⅜x6 and sizes smaller and shorter 50%
Carriage sizes, larger and longer than ⅜x6 ..... 40-5%
Machine, ⅜x4 and sizes smaller and shorter 50%
Machine, sizes larger and longer than ⅜x4 ..... 75%
Stove 75-10%
Mortise, Door.
Gem, iron 5%
Gem, bronze plated 5%
Barrel.
Cast ..... Net
Wrought ..... "
Wrought, bronzed ..... "
Flush.
Wrought ..... Net
Spring.
Wrought ..... "
Wrought, heavy ..... "
Square.
Wrought ..... "

BOXES.

Mail. No.	2	4	10
Per doz.	$18 00	$23 00	$29 00

Cast Iron.
Per doz. $9 50
Mitre.
Stanley's ..... Net Prices
Stearns, No. 2 .. per doz. $30 00

BRACES, RATCHET.

V. & B. No. 444 8 in.	$4 54
V. & B. No. 222 8 in.	3 89
V. & B. No. 111 8 in.	3 55
V. & B. No. 11 8 in.	3 02

BURRS, RIVETING.

Copper Burrs only 40-5%
Tinners' Iron Burrs only ..... Net

BUTTS.

Steel, antique copper or dull brass finish—case lots—3½x3½ ... per dozen pairs $3 00
4x4 ... " " " 4 20
Heavy Bevel steel inside sets, case lots— ..... per dozen sets 7 20
Steel bit keyed front door sets, each 1 80
Wrought brass bit keyed front door sets, each 3 30
Cylinder front door sets, each 7 50

CALIPERS.

Double ..... Net
Inside and Outside ..... "
Wing ..... "

CARRIERS.

Hay.
Diamond, Regular ... each, net
Diamond, Sling ..... " "

CASTERS.

Standard—Ball Bearing. ..... 50 & 10%
Bed 40%
Common Plate.
Brass Wheel 15%
Iron and porcelain wheels, new list 50%
Philadelphia Plate, new list 50%
Martin's 40%

CATCHERS, GRASS.

No. 160S	per doz.	$12 25
No. 165S	" "	14 01

CEMENT, FURNACE.

American Seal, 5 lb. cans, net		$ 45
" " 10 lb. cans, "		90
" " 25 lb. cans, "		2 00
Asbestos, 5 lb. cans	"	45
Pecora	per 100 lbs.	7 51

CHAINS.

Proof Coil, ⅜" 100 lbs.	$ 8 75
Weldless Coil, ...	50-5%
Electric Cow Welded Ties, No. 00, 4½, per doz.	2 85
Safety.	
12 yds., per box	75
500 ft. spools, per ft. ...	02

CHALK, CARPENTERS'.

Blue	per gro.	$2 00
Red	" "	2 00
White	" "	1 80
Common White School Crayon ...	" "	0 30

CHIMNEY TOPS.

Iwan's Complete Rev. & Vent. 30%
Iwan's Iron Mountings only .. 35%

CHECK, DOOR.

Corbin ..... Net list
Russwin ..... Net list

CHISELS.

Cold.	
V. & B. No. 25, ¼ in., each	$0 26
V. & B. No. 25, ⅝ in., each	41
Diamond Point.	
V. & B. No. 55, ¼ in.	0 31
V. & B. No. 55, ½ in.	0 48
Firmer Bevelled.	
Round Nose.	
V. & B. No. 65, ¼ in.	0 29
V. & B. No. 65, ½ in.	0 40
Socket Firmer.	
Cape.	
V. & B. No. 50, ⅜ in.	0 31
V. & B. No. 50, ¾ in.	0 57

CHUCKS, DRILL.

Goodell's, for Goodell's Screw Drivers ..... List less 35-40%
Yankee, for Yankee Screw Drivers $6 00

CLAMPS.

Adjustable.
Martin's 30%
No. 63, Screw 20%
No. 100, Door (Stearns) doz. $22 00
Cabinet.
Screw 20%
Carpenters'.
Steel Bar .. List price plus 20%
Carriage Makers'.

2½-inch	per doz.	$ 7 00
5 - "	"	14 00
8 - "	"	28 00
12 - "	"	42 00

Hose.
Sherman's brass, ¾-inch per doz. $0 48
Double, brass, ¾-inch, per doz. 1 20
Saw Filers.
No. 1, Adjustable (Stearns) doz. ..... $ 8 75

CLAWS, TACK.

Wood hdl. No. 10.	per doz.	$1 15
Forged steel, wood hdl.	"	2 15
Solid steel	"	3 25
Giant	"	50

CLEVISES.

Malleable ..... 10c lb.

CLIPPERS.

Bolt (Carolus).	
No. 0	$2 50
No. 1	3 25
No. 3	4 25

CLIPS.

Axle ..... 65 & 5%
Damper.
Acme, with tail pieces, per doz. $1 25
Non Rivet tail pieces, per doz. 25
Non Rivet Clips 90
Hame 50

COLLARS, STOVE PIPE.

Lacquered.

Inches	5	6	7
Fancy pattern, per doz.	65c	75c	$4 00

COMPASSES.

Carpenters' 15%

COPPERS—Soldering.

Pointed Roofing.

3 lb. and heavier	per lb.	40c
2½ lb.	"	45c
2 lb.	"	48c
1½ lb.	"	55c
1 lb.	"	60c

CORD.

No. 7 Std.	per doz. hanks.	$ 9 85
No. 8	" " "	11 40

SPECO
SOLDERING FLUX

The **Protective** flux. Protects the seam or joint against future corrosion from moisture in the air. Because it gives this protection it is used on auto radiator, radio, dynamo and other very particular work. As it costs no more than others it is naturally the kind to use for general soldering. Try Speco, the absolutely non-corrosive new formula flux now. Free sample shipped promptly to prove my statement.

FOR FREE SAMPLE Put your name and your jobber's name in space above at right please and mail this advertisement to

SPECIAL CHEMICALS CO.
397 CENTRAL AVE., HIGHLAND PARK, ILL.

SPECO
SOLID SAL AMMONIAC

Why if Speco didn't have any added conveniences over English lump it would still be used by its thousands of users because of its superior quality.

In fact, forgetting the convenience of Speco for a moment, the quality and economy of Speco would cause any one to prefer it.

Its quality makes soldering easier and quicker—its long life and no waste features make it the least expensive.

Buy Speco Sal Ammoniac next time because it's better—its other advantages will reveal themselves.

Let us send you a sample cake

VESUVIUS
Blow Torches and Stoves

For Gasoline

have an extremely powerful flame. They are made of the best material that can be obtained and their construction insures long serviceability.

Write for Descriptive Circular Today

For Coaloil

QUICK MEAL STOVE CO.
Div. American Stove Company
825 Chouteau Avenue St. Louis, Mo.

New "Master" Line Kerosene-Burning Plumbers' Furnace

Has only two openings in the tank.

Has Safety Valve and Air Release.

Double Jet without coil insure hotter, quicker flame than you get on any other furnace.

Send for Bulletin

THE TURNER BRASS WORKS
Sycamore, Ill. U.S.A.
Oak Street

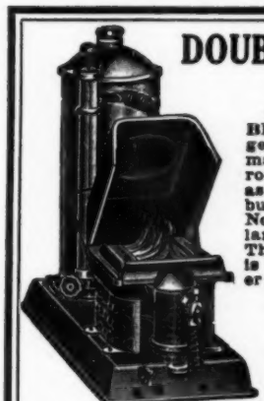
Torrid

Easy to sell makes easy profits. This is characteristic of Torrid Furnaces. The reason is they give complete satisfaction. Once a user is always a user. They are a standard of their own reputation.

No. 15
List Price, each $14.50
Sold By Jobbers

GEO. W. DIENER MFG. CO., CHICAGO

DOUBLE BLAST FIRE POTS
Gasoline Burning



No. 25 DOUBLE BLAST Tinners' Fire Pot

The **GENERATOR** used in **DOUBLE BLAST FIRE POTS** is the most powerful generator ever put on a fire pot. It is made of brass and will not rust or corrode. It has no packing of any kind, and as it has no small channels it cannot clog but will always burn a blue flame. Our **No. 25 Fire Pot** shown herewith has a large brass pump one inch in diameter. The tank is made of galvanized steel and is firmly fastened to the base. The burner on this fire pot is so arranged that the two hot blasts are forced from the outside to the center so that the iron in the fire receives both hot blasts. There are more features that you should know about.

Our latest catalog discribes our line in full. Write for it today.

DOUBLE BLAST MFG. CO.
NORTH CHICAGO, ILL.

You Should Order NOW

your requirements of torches and furnaces for the coming winter. When the cold weather arrives you will then have a stock on hand, thereby enabling you to give your customers satisfactory deliveries.

During the winter there is usually a shortage of torches and furnaces. This is due to the unlimited number of orders placed with the manufacturers. You, of course, know that orders are filled in order of date received.

Then again, if you do not order far enough ahead, the tools cannot reach you in time when shipped by freight. Don't forget, exorbitant express charges cut deep into your profits.

We now have in stock a full line of "ALWAYS RELIABLE" torches and furnaces which is ready for immediate delivery. Place your stock order now and insure delivery.

Most jobbers stock our line. Others will gladly order for you.

OTTO BERNZ CO., Newark, N. J.

No. 21 Fire Pot
List Price Each $21.20
Ask for Discount

QUALITY FIRE POTS

There is more economy and satisfaction in using No. 21 than any Coil Fire Pot made. Tank is heavy gauge drawn steel, having Patented Cushion Protection Band at base. It will stand hard service and can not leak. Pump, Coil, Burner and all fittings are the very best. Each Fier Pot is carefully inspected and burned as a heat test. No. 11 is the same, with rubber bulb. Jobbers supply at factory prices. Send for a catalog.

CLAYTON & LAMBERT MFG. CO.
10635 Knodell Ave. DETROIT, MICH., U.S.A.

Read the Wants and Sales Pages

COTTERS, SPRING.

All sizes 87½%

COUPLINGS, HOSE.

Brass..... per doz. $2 25

CUT-OFFS.

Standard gauge..... 35%
26 gauge..... 20%
Kuehn's Korrekt Kutoffs:
Galv., plain, round or cor. rd.
Standard gauge 40%
26 gauge 10%

DAMPERS, STOVE PIPE.

Diamond.
6-inch..... per doz. $1 50
Cast "American."
6 inch per doz..... $1 50
7 " " " 2 25
8 " " " 3 60
9 " " " 5 40
10 " " " 6 75
12 " " " 8 00
Check.
7 inch, each..... $1 00
8 " " 1 25
9 " " 1 50
10 " " 1 75
12 " " 2 25
Steel Hot Air.
8 inch per doz..... $2 50
9 " " " 2 75
10 " " " 3 00
12 " " " 3 60
14 " " " 4 50

DIGGERS.

Post Hole.
Iwan's Split Handle (Eureka)
4-ft. Handle...per doz. $14 00
7-ft. Handle...per doz. 36 00
Iwan's Hercules pattern, per doz. 14 90

DRILLS.

V. & B. Star, 12-inch Length.
¼, 5/16 and ⅜, each.....$ 25
⅝, each 36
1, each 54
1¼, each 81
V. & B. Star, 18-inch Length.
5/16 and ⅜, each.....$ 33
⅝, each 45
1, each 69
1¼, each 1 05

EAVES TROUGH.

79% of Standard List.
Milcor .....
Galv. Crimpedge, crated.....75%

ELBOWS—Conductor Pipe.

Galvanized Steel, Tin and Terne
Plain Round or Round Corrugated
2 to 6 inch, Std. gauge ..65%
2 to 6 inch, 26 gauge 45%
2 to 6 inch, 24 gauge 20%
Milcor .....
Galv., plain or corrugated, round flat.
Crimp. Std. gauge.....65%
26 Gauge Std. gauge.....45%
24 Gauge Std. gauge.....15%
Square Corrugated.
Standard gauge 60%
26 gauge 30%
Milcor .....
Standard gauge 50%
26 gauge 35%
Portico Elbows.
Standard Gauge Conductor Pipe, plain or corrugated.
Not nested .....70 & 5%
Nested solid.....70 & 5%

ELBOWS—Stove Pipe.

1-piece Corrugated. Uniform.

	Doz.
5-inch	$1 38
6-inch	1 54
7-inch	1 98

Special Corrugated.

	Doz.
6-inch	$1 27
7-inch	1 76

Uniform, Collar Adjustable.

	Doz.
5-inch	$1 76
6-inch	1 98
7-inch	2 48

WOOD FACES—50% off list.

FENCING.

Lawn fence, single spaoe, 36-inch ..... $ 9 12
Lawn fence, single space, 42-inch 10 20
Lawn fence, double space, 32-inch 12 50
Lawn fence, double space, 42-inch 13 75
Field fence, 26-inch, No. 10 top and bottom 12 filling 26 50
Same, 6 filling..... 33 82
Field fence, 32-inch, No. 10 top and bottom 12 filling 30 34
Same, 6 filling..... 39 41

FILES AND RASPS.

Heller's (American).....65-5%
American 65-5%
Arcade .....60 & 10%
Black Diamond 50-5%
Eagle 60-10%
Great Western .....60 & 10%
Kearney & Foot.....60 & 10%
McClellan .....60 & 10%
Nicholson 50-10%
Simonds 60%
J. Barton Smith.....50-10-5%
X F .....Net list

FIRE POTS.

Clayton & Lambert's.
East of west boundary line of Province of Manitoba, Canada, No. Dakota, So. Dakota, Nebraska, Kansas, Oklahoma, Amarillo, San Angelo and Laredo, Texas 55%
West of above boundary line.52%

Turner Brass Works.	Ea.
No. 43 Kerosene-Gasolene Master Torch, 1 qt.....	$5 40
No. 48 Kerosene-Gasolene Master Torch, 1 qt.....	6 73
No. 95 Double Jet Torch, Gasolene, 1 qt.....	6 95
No. 30 Kerosene-Gasolene Torch, 1 qt. (new line)..	6 48
No. 33 Single Jet Gasolene Torch, 1 qt.....	6 93
No. 53 Plbrs. Furn. Galv. Iron Tank with Bulb, 7 pts.	6 75
No. 63 Plbrs. Furn. Galv. Iron Tank with Pump, 7 pts.	7 47
No. 56 Plbrs. Furn. Straight Side Steel Tank with Bulb, 7 pts.....	8 82
No. 66 Plbrs. Furn. Straight Side Steel Tank, with Pump, 7 pts.....	9 54

Otto Berns Co.	
No. 1 Furn. Gasolene with large shield, 1 gal.....$	6 75
No. B Furn. Kerosene, 1 gal.	15 12
No. 10 Brazier, Kerosene or Gasolene, 10 gals...	47 52
No. 5 Torch, Gasolene or Kerosene, 1 pt.....	7 92
No. 83 Torch, Gasolene, 1 quart	5 40
No. 86 Torch, Gasolene, 1 pt.	4 05

GALVANIZED WARE.

	Per doz.
Pails (Competition), 8-qt...	$1 85
10-qt.	2 00
12-qt.	2 35
14-qt.	2 50
Wash tubs, No. 1.....	5 85
No. 2	7 00
No. 3	7 75

GARAGE DOOR HARDWARE.

Stanley .....All net

GAUGES.

Marking, Mortise, etc.....Nets
Wire.
Disston's 25%

GIMLETS.

Discount.....65% and 10%

GLASS.

Single Strength, A. and B. all sizes.....83 & 84%
Double Strength, A, all sizes 79%
Double Strength, B, all sizes, 85%

GLUE.

Bulk.	
B Amber .....per lb.	35c
A White ..... "	40c
H. S. Amber..... "	32c
Liquid.	
Army & Navy.....	40%
Le Page's—	
List "A"	37½%
List "B"	35 %
List "C"	25 %

GREASE, AXLE.

Wood Boxes.
Frazer's .....per gro. 13 00
Hub Lightning 7 50
Wood Pails.
Frazer's, 15 lb., $1.00; 25 lb., $1.50 each.
Hub Lightning, 15 lb., 90c; 25 lb., $1.21 each.

HAFTS, AWL.

Brad.
Common .....per doz. $0 35
Peg.
Patent, plain top. " 60
Patent, leather top " 80
Sewing.
Common ..... " 24
Patent ..... " 55

HAMMERS, HANDLED.

	Each, net
All V. and B.	
Blacksmiths' Hand, No. 0 26-oz.	$1 00
Engineers' No. 1, 26-oz.....	1 00
Farriers', No. 7, 7-oz.....	93
Machinists', No. 1, 7-oz....	78
Nail.	
Vanadium, No. 41, 20-oz., each	1 45
Vanadium, No. 41½, 16-oz., each	1 45
V. & B., No. 11½, 16-oz., each	1 04
Garden City, No. 111½, 16-oz., each	87
Tinner's Riveting, No. 1, 8-oz., each	82
Shoe, Steel, No. 1, 13-oz., each	65
Tack.	
Magnetic.	
No. 5, 4-oz., each.....	72

HAMMERS, HEAVY.

Farrier's 20%
Mason's.
Single and Double Face....50%

HANDLES.

Agricultural Tool.
4½-inch, plain...per doz. $3 50
Auger.
Common Assorted, per doz. $0 75
Pratt's Adjustable, Nos. 1 & 2, per doz..... 6 00
Ives' Adjustable, per set.. 1 35
Axe.
Hickory, No. 1....per doz. 3 00
Hickory, No. 2.... " 2 00
1st quality, second growth 6 00
Special white, 2nd growth 4 50
Chisel.
Hickory, Tanged, Firmer Assorted .....per doz. 55c
Hickory, Socket Firmer, Assorted .....per doz. 70c
Coal Pick 40%
Drifting Pick 40%
File, ...per doz. $1 20
Hammer and Hatchet.
No. 1 per doz.....$0 90
Second growth hickory, per doz. 1 40
Hay and Manure Fork, Handles, Strap and Ferrule ..... per doz. $7 00
Screw Driver.
Assorted .....each 6c
Shovel and Spade.....Net
Soldering.
Per doz. $2 40

HANGERS.

Conductor Pipe.
Milcor Perfection Wire.....25%
Eaves Trough.
Steel hangers 30%
Triple Twist wire.....10%
Milcor Eclipse Wire.....15%
Milcor Triplex Wire.....10%
Milcor Milwaukee Extension..10%
Milcor Steel (galv. after forming) List plus 12½%
Milcor Selflock E. T. Wire, List plus 40%

HASPS.

Hinge, Wrought, with staples.Net

HATCHETS.

V. and B. Supersteel.	Each
Broad, No. 1, 24-oz.....$	1 43
Broad, No. 3, 32-oz.....	1 78
Half, No. 1, 15-oz.....	1 25
Half, No. 3, 27-oz.....	1 37
Claw, No. 1, 19-oz.....	1 31
Claw, No. 2, 25-oz.....	1 37
Flooring, No. 1, 20-oz.....	1 43
Flooring, No. 2, 24-oz.....	1 60
Shingling, No. 1, 17-oz.....	1 20
Shingling, No. 2, 23-oz.....	1 25
Lathing, No. 1, 14-oz.....	1 20
Lathing, No. 2, 17-oz.....	1 25
Vanadium Steel.	
Half, No. 62, 22-oz.....$	1 82
Underhill Pattern Lathing, 9 row, 19-oz.....	2 29

HINGES.

Heavy Strap, in Bundles.	
4 inch, doz. prs.....$	0 93
5 " " "	1 12
6 " " "	1 54
8 " " "	2 55
Extra Heavy T in Bundles.	
4-inch, doz. prs.....$	1 41
5 " " "	1 50
6 " " "	1 85
8 " " "	3 20

HOES.

Garden .....Net

HOOKS.

Box.
V. and B. No. 9, each....$0 26
Conductor.
Conductor hooks 20-10%
Milcor .....
"Direct Drive" Wrought Iron for wood or brick..15%
Cotton.
V. and B. No. 8, each.... 24
Hay.
V. and B. No. 1, each.... 26
Bar Meat.
V. and B. No. 26, ⅝", each 09
V. and B. No. 28, ½", each 16
Screw Meat.
V. and B. No. 2, per gro.. 6 50
Butchers' "S."
V. and B. No. 6, each..... 08
V. and B. No. 8, each..... 11

HOSE.

	Per Ft.
⅝-in. 2 ply molded..	9½c to 12¾c
⅝-in. cord	8½c to 10c
¾-in. wrapped	9½c to 13½c

IRONS.

Sad.	
Charcoal .....per doz.	11 00
Common, polished, per 100 lbs.	7 75
No. 70 Asbestos.....$	1 50 net
No. 100 "	1 75 net
Common, nickel plated Mrs. Potts.'	$ 25
No. 50 J. Enterprise, per set	Nets
No. 55 J. " " "	
No. 50 T. " " "	
No. 55 T. " " "	
E. C. Stearns.'	
No. OA Corner, doz. sets.	$2 50
No. OB " " "	2 75

JACKS.

Wagon.		
Richard's No. 1.per doz.	$15 50	
Oliver,		
Each .....$	0 60	$0 80
Nos.	0	00
Standard,		
Each .....$	0 60	$1 00
Nos.	1	2
Big Lift		40%
Tiger		40%

KNIVES.

Beet Topping.
Clyde, 9-in. Scimitar Blade, doz. 25%
California 25%
Butcher.
Beechwood Handles, 6-inch blade 25%
Beechwood Handles, 7-inch blade 25%
Beechwood Handles, 3-inch blade 25%
Cooper's Hoop 25%
Drawing.
Standard 25%
Adjustable 25%
Barton's Carpenters' 25%
Hay.
Iwan's Solid Socket.....25%
Heath's 25%
Iwan's Sickle Edge.....25%
Iwan's Imp'd Serrated....25%
Hedge.
Challenge 25%
Disston's No. 1.....25%
Putty.
Common 25%
Lander's 25%
Scraping.
Beech Handle 25%
Lander's 25%

KNOBS.

Door.
Mineral .....per doz. $2 00
Porcelain ..... " 2 00
Jet ..... " 2 00

LADDERS.

Step.
Common, per ft.....28c
Common, with Shelf, add 10c
IXL 34c
Challenge, 6 to 9 ft.....55c
10 to 16 ft.....60c

LANTERNS.

	Per doz.
Monarch tin, hot blast.....$	8 25
Dietz No. 2, cold blast.....	13 00
Best tubular	8 25
Competition lanterns No. 0 tubular	6 90

LEATHER BELTING.

From No. 1 Oak Tanned Butts.
Extra heavy, 18-oz.....35%
Heavy, 16-oz.....40%
Medium, 14½-oz.....40%
Light, 13-oz.....50%

LEATHER LACING.

Cut, strictly No. 1.....45%

LEVELS.

Disston,	No. 28 Asst.....	$22 05
"	No. 18, 20 in., each	1 83
"	No. 22, 24 in., each	2 40
"	Shafting, 6 in.....	19 80
"	" 6 in. gr. glass	24 20
"	No. 1 Asst.....	5 75
"	No. 2 Asst.....	12 40
"	24-26 in., each....	1 02
"	28-30 in., each....	1 00

LIFTERS.

Stove Cover.
Coppered .....per gro. $6 00
Alaska ..... " 4 75
Transom.
Payson's 55%

LOCKS.

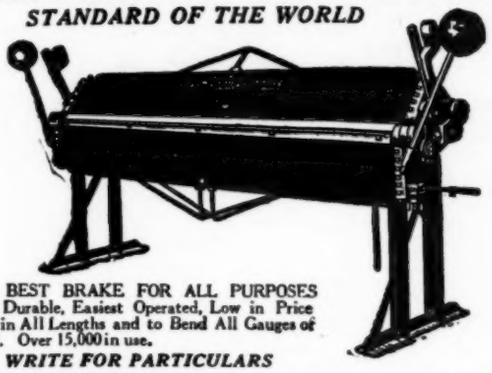
Barn Door.
No. 60 Stearns..per doz. $11 00
No. 80 " " 20 00

MALLETS.

Carpenters'.
Fibre Head, No. 2, per doz. $12 00
" No. 3, " 15 50
" No. 3½ " 20 50
Round Hickory .....per doz $3 00— 5 00
Tinners'.
Hickory .....per doz. $2 25

CHICAGO STEEL CORNICE BRAKES

STANDARD OF THE WORLD



THE BEST BRAKE FOR ALL PURPOSES
Most Durable, Easiest Operated, Low in Price
Made in All Lengths and to Bend All Gauges of Metal. Over 15,000 in use.

WRITE FOR PARTICULARS

DREIS & KRUMP MFG. CO., 2915 S. Halsted Street, CHICAGO

TREADLE SHEAR

This TREADLE GAP SHEAR is made in all standard sizes for No. 14 and lighter gauge sheets. With it, sheets can be squared, trimmed or slit.

We make a complete line of shears, punches and bending rolls, all sizes for hand or belt drive. Write for Catalog "S."

BERTSCH & COMPANY Cambridge City, Ind.

ART METAL CEILINGS AND SIDE WALLS

QUALITY—DURABILITY—BEAUTY

Are thoroughly combined in **FRIEDLEY-VOSHARDT ART METAL CEILINGS AND SIDE WALLS.** We have added to our list a great number of new and handsome designs. Special designs can be made if desired. Only the ***best*** of materials used. We are prepared to serve ***you.*** Ceiling Catalog No. 33 on request.

DONT DELAY—WRITE TODAY

FRIEDLEY-VOSHARDT CO.

Office: 733-737 S. Halsted St.
Factory: 761-771 Mather Street

CHICAGO, ILLINOIS

PEERLESS EAVES TROUGH HANGER

Send Ten Cents in Stamps for a Sample and 25c Will Be Credited on Your First Order.

ABBOTT MFG. CO.
4700 Central Ave. S. E.
CLEVELAND - OHIO

ADVERTISED NATIONALLY

That's Why It's Easy to Sell

A powerful general utility punch. Perforates cardboard, leather and paper up to ¼". Thru untempered metal up to 20 gauge. Made of Drop Forge Steel. Handles interchangeable punches and dies as illustrated. You'll sell them fast. Order NOW from your jobber.

Tool with 1 Punch and Die Retail **$3**

Tool, with complete set of 6 Punches and Dies. Retail Price Complete **$5.00**

SAMSON No. 1 HAND PUNCH

Write for Catalogue and our attractive proposition.
Chicago Agents: Carr Supply Co., 412 N. Dearborn St.

MACHINE APPLIANCE CORPORATION
351 Jay Street Brooklyn, N. Y.

Terne Plate Specialists

since the beginning of the industry in this country

Let us quote on your requirements.

THE J. M. & L. A. OSBORN COMPANY, ***Cleveland***
Sheet Metal Workers' and Furnacemen's Supplies

ILLINOIS
ZINC SHINGLES
THE ROOF THAT'S ALWAYS NEW

ILLINOIS ZINC COMPANY

332 So. Michigan Ave., Chicago, Ill.
280 Broadway, New York City
1331 Filbert St., Philadelphia, Pa.
Smelters and Rolling Mills, Peru, Ill.
Established 1870

C. G. HUSSEY & CO.

Rolling Mills and Office, PITTSBURGH, PA.

Manufacturers of

SHEET COPPER, BOTTOMS, ROLL COPPER, TINNED AND POLISHED COPPER, NAILS, SPIKES, RIVETS, CONDUCTOR PIPE, EAVES TROUGH, ELBOWS, SHOES, MITRES, ETC.

Branch Warehouses in New York, Chicago and St. Louis

Plecker's Galvanized Eave Trough and Corrugated Expanding Conductors

Made of Keystone Copper Bearing Steel

Costs no more
Lasts Longer
Therefore
Cheapest

CLARK-SMITH HARDWARE CO. **PEORIA, ILLINOIS**

"THE STANDARD" VENTILATOR and CHIMNEY CAP

DOES away with high stacks, swings freely in the slightest breeze and positively cures down-drafts. The strongest and most efficient combination to be had. Has no equal for chimney purposes. All jobbers sell them—write your jobber or us for prices and catalog today.

Manufactured by

STANDARD VENTILATOR CO.
LEWISBURG, PA.

MATS.

Door.
National Rigid ....5 & 10 & 5%
Acme Steel Flexible.....50%

MEASURES.

Galvanized, doz.....Nets
Japanned, doz. .....Nets

MITRES.

Galvanized steel mitres, and caps, end pieces, outlets...30%
Milcor .....
Galv. one piece stamped....40%

MOPS.

Cotton, Star (Cut Ends).

Pounds	12'	15'	18'	24'-3-oz.
Per doz.	$4 00	4 35	5 50	7 00

Enterprise 16⅔%
Parker .....50 & 5%

NAILS.

Cut Steel $4 60
Cut Iron 4 60
Wire.
Common 3 45
Cement Coated.
Small Lots 2 30
Horseshoe.
Ausable .....55 & 5%
Capewell 15%
Perfect .....55 & 5%
Putnam .....20 & 5%
Star .....30 & 5%
Picture.
Brass Heads 25%
Brads 70%
Furniture.....List plus 15%

NETTING, POULTRY.

Galvanized before weaving...50%
Galvanized after weaving...40%

NIPPERS.

Nail Cutting.
V. & B. No. 30.....78c
Double Duty.
V. & B. No. 60.....76c
Hoof.
Heller's .....40 & 10%
V. & B., No. 52, each.....$2 25

NOZZLES.

Hose.
Magic .....per doz. $9 50
Diamond ..... " 5 75

OILERS.

Chase Pattern.
Brass and Copper.....10%
Zinc Plated .....40 & 10%
Railroad.
Brass .....20&5%
Coppered .....50 & 50%
Steel.
Copper Plated.....70 & 5%

OPENERS.

Can.
Delmonico .....per doz. $1 30
Never Slip ..... " 65
Crate.
V. & B.....per doz. $7 25-11 00

PAILS.

Cream.
14-qt. without gauge, ...per doz. $9 50
18-qt. without gauge, ...per doz. 11 00
20-qt, without gauge, ...per doz. 11 75
Sap.
10-qt., IC Tin....per doz. $4 00
12 " " " " 5 50
Stock.

Galv. qts.	14	16	18	20
Per doz.	$9 75	10 75	12 75	14 50

Water.

Galvanized qts.	10	12	14
Per doz.	$5 75	6 50	7 25

Wood.
Cable, 2-Hoop....per doz. Nets
Cable, 3-Hoops... " Nets
Cable, 3-Hoops, brass " Nets

PANS.

Dripping .....Net
Fry.
Common .....Nets
Acme ..... "
Roasting.
Paxton,
Nos. 1 2 3 4
Per doz. .....Nets

PAPER.

Roofing.	Per Square
Best grade, state surf. prepd.	$1 85
Best talc surfaced.....	2 25
Medium talc surfaced.....	1 60
Light talc surfaced.....	0 90
Red Rosin Sheathing, per ton	65 00

PICKS.

Contractors' 40%
Railroad .....50 & 5%

PINCERS.

All V. & B.
Carpenters', cast steel,

No.	6	8	10	12
Each	$0 43	$0 52	$0 61	$0 71

Blacksmiths', No. 10.....$0 64

PINS.

Clothes.
Common, per box of 5 gro. $0 95

PIPE.

Conductor.
Plain Round and Round Corrugated.
29 Gauge .....70&5%
28 " .....70&5%
26 " .....70&5%
24 " .....70&5%

"Interlock" Galvanized.
Crated and nested (all gauges) 60-20%
Crated and not nested (all gauges) 60-15%

Square Corrugated A and B and Octagon.
29 Gauge 65%
28 " 65%
26 " 65%
24 " 65%

"Interlock."
Crated and nested (all gauges) 60-20%
Prices for Galvanized Toncan Metal, Genuine O. H. Iron, Lyonmore Metal and Keystone C. B. on application.

Stove. Per 100 joints

26 gauge, 5 inch E. C. nested	15 40
26 gauge, 6 inch E. C. nested	16 50
26 gauge, 7 inch E. C. nested	18 70
28 gauge, 5 inch E. C. nested	13 20
28 gauge, 6 inch E. C. nested	14 30
28 gauge, 7 inch E. C. nested	16 50
30 gauge, 5 inch E. C. nested	11 00
30 gauge, 6 inch E. C. nested	12 10
30 gauge, 7 inch E. C. nested	14 30

T-Joint Made up.
6-inch .....per 100 38 50

Furnace Pipe.
Double Wall Pipe and Fittings 40%
Single Wall Pipe, Round Pipe Fittings 40%
Galvanized and Back Iron Pipe, Shoes, etc.....40%
Milcor, galvanized.....Net

PLANES.

Stanley Iron Bench.....Net

PLIERS.

(V. & B.)

Nut,	No. 3, each.....	$2 60
"	No. 5, each.....	64
"	No. 25, each.....	69
Gas,	No. 7, each.....	55
"	No. 8, each.....	61
"	No. 12, each.....	87

Lining or Crimping.
No. 35, each..... 64
Button's Pattern.
No. 6 each..... 61
No. 8 each..... 74
Double Duty, No. 106..... 50

POINTS, GLAZIERS.

No. 1, 2 and 3...per doz. pkgs. 65c

POKERS, STOVE.

Wr't Steel, str't or bent, ... per doz. $0 75
Nickel Plated, coil han'l's " 1 10

PULLEYS.

Awning—Jap'd 10%
Clothes Line 10%
Hay Fork.
Iron Wheel, 5-in..per doz. $2 50
Wood Wheel, 6-in. " 2 65
Wood Wheel, 6-in. pass knot ..... " 3 00
Sash.
Common .....Net
Common-Sense, 2-in .....Net
Empire Pattern, 2-in.....Net
Ideal .....Net
Steel .....Net

PUMPS.

Spray.
Midget Junior....per doz. $3 75
New Misty ..... " 6 00
Crescent ..... " 6 50

PUNCHES.

Machine.	Each
V. & B., No. 11-13, ½x6...	$ 19
V. & B., No. 90, ⅝x9.....	27
V. & B., No. 10. ¾x10.....	29
V. & B., No. 1-6, ½x6.....	12

Center.
V. & B., No. 50, ⅜x4..... 14
Belt.
V. & B., No. 101-103..... 24
V. & B., No. 108-109..... 33
V. & B., No. 25, ass't.....3 80
Parker Metal Punch No. OX .....each $7 00
Parker Extra Punch. 30
Parker Extra Die..... 40
Whitney's Ball Bearing.. .....Prices on application

PARERS.

Apple.
Goodell's .....per doz. $10 80
Turntable ..... " 11 40
White Mountain " 8 40
Reading No. 78 " 11 40

PUTTY.

Commercial Putty, 100-lb. kits $3 60

RAKES.

Garden.	Per doz.
Steel, Bow, 12-inch Teeth	$8 50
Steel, Bow, 14-inch "	9 25
Malleable Iron, 12-in. "	4 75
Malleable Iron, 14 in. "	5 00

Hay.
Wood, 10 Teeth.....$4 00
Lawn.
30 Teeth .....per doz. 5 50

RAZORS—SAFETY.

Gillette .....per doz. $45 00
Auto Strop ..... " 45 00
Gem ..... " 8 40
Gem (3 doz. lots).. " 8 00
Ever Ready ..... " 8 40
Ever Ready (3 dz. lots)" 8 00

RAZORS STRAIGHT.

RAZOR STROPS.

Star (Honing) 50%

FLOOR REGISTERS AND BORDERS.

Cast Iron 15%
Steel and Semi-Steel.....30%
Baseboard 30%
Adjustable Ceiling Ventilators 30%
Register Faces—Cast and Steel
Japanned, Bronzed and Plated, 4x6 to 14x14.....30%
Large Register Faces—Cast, 14x14 to 38x42.....50%
Large Register Faces—Steel, 14x14 to 38x42.....60%

REGULATORS.

(Parker Dial Damper with Bearings.)
Each .....$ 50
Per doz. 5 50

RIDGE ROLL.

Galvanized.
Crated 70-25%
Wired 70-25-5%
Milcor .....
Plain, crated 75%
Plain, bundled 75-2½%

RIVETS.

Copper Belt .....50% Discount
Coppered Iron 50%
Tinners' 50%
Hame..... per lb. $0 17
Slotted Clinch per doz. 60 @ 1 10
Tubular.
Nos. 1 and 2 assorted sizes, 50 in box.....doz. 75c
Nos. 1 and 2 assorted sizes, 10 in box.....doz. 1 40

ROPE.

Cotton.
¼, 5-16 in. and larger, per lb. .....50c to 60c
Sisal.
1st Quality, base 12½c to 15½c
No. 2.....11c to 14½c
Manila.
1st Quality standard brands .....16½c to 18½c
No. 2 .....15½c to 16½c
Hardware Grade, per lb. 15½c

SAWS.

Butchers'.

Atkins	No. 2, 14-in.....	$12 75
"	No. 2, 18-in.....	14 30
"	No. 7, 16-in.....	15 85
"	No. 2, 22-in.....	15 92
"	No. 7, 20-in.....	18 05
"	No. 7, 24-in.....	20 20
"	No. 7, 28-in.....	22 35

Compass.

Atkins	No. 2, 10-in.....	$ 5 45
"	No. 10, 10-in.....	5 60
"	Blades, No. 2, 10-in.	3 25
"	" No. 2, 10-in.	3 30

Cross-Cut.

Atkins	No. 221, 4-ft.....	3 03
"	No. 221, 6-ft.....	4 45
"	No. 221, 8-ft.....	6 07

Flooring, Hand.

Atkins	No. 96, 16-in.....	20 45
"	No. 96, 20-in.....	21 70

Hand and Rip.

Atkins	No. 54, 20-in.....	19 50
"	No. 54, 26-in.....	24 40
"	No. 53, 16-in.....	18 10
"	No. 53, 20-in.....	22 90
"	No. 53, 24-in.....	26 60
"	No. 53, 28-in.....	31 45
"	No. 53, 30-in.....	34 15

Keyhole.

Atkins	No. 1, complete..	3 10
"	No. 2, complete..	3 70

Miter Box.

Atkins	No. 1, 4x20.....	32 65
"	No. 1, 5x22.....	38 90
"	No. 1, 6x22.....	42 20

Pruning.

Atkins	No. 20, 12-in....	8 45
"	No. 10, 16-in....	18 15

Wood.

Atkins	No. 202.....	7 19
"	No. 318.....	8 75
"	No. 906.....	15 50
"	No. 1509.....	16 56

SCOOPS.

Hubbard Western Pattern Riveted.

Size	A	B	C	D
1..	$16 75	16 00	15 25	14 45
4..	17 85	17 10	16 35	15 60
6..	18 65	17 85	17 10	16 35

SCRAPERS.

Box.
No. 6, six blades, each.... 25c
Hog.
No. 6. each..... 25c
Floor (Stearns).
No. 10, each.....$11 50

SCREEN DOOR HINGES.

Cast iron .....gross $13 00
Steel ..... " 9 50

SCREWS.

Jack.....Standard List 45%
Lag or Coach—all sizes, gimlet pointed 40-10%
Wood.
F. H. Bright.....82-5%
R. H. Blued.....75-20-5%
F. H. Jap'd.....70-20-5%
F. H. Brass.....78-5%
R. H. Brass.....70-20-5%
Sheet Metal.
No. 7, ½x½, per gross...$ 55
No. 10, ¾x3/16, per gross.. 75
No. 14, ⅜x¼, per gross... 90

SCREW DRIVERS.

Uncle Sam Standard Head.

3 inches, each.....	$ 45
5 inches, each.....	52
8 inches, each.....	68
12 inches, each.....	1 02

Uncle Sam Insulated Head

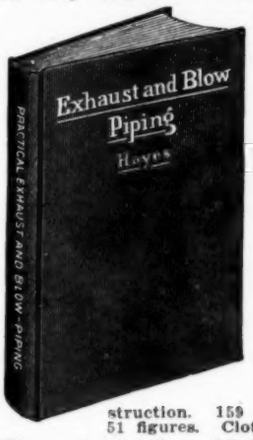
3 inches, each.....	$ 49
5 inches, each.....	57
8 inches, each.....	76
12 inches, each.....	1 14

SETS.

Nail.
V. & B.
No. 100, in cardboard boxes .....doz. $1 55
No. 100, in wooden boxes, ... doz. 1 58
No. 30, assorted,....doz. 39
No. 5, in cardboard boxes, ... doz. 1 25
No. 5, in wooden boxes, ... doz. 1 30
Rivet.
V. & B.
Farmers' $0 19
Tinners' 3-4 ..... 0 40
" 00-0 ..... 0 60
Saw.
Atkins No. 10....per doz. $3 80
" No. 12.... " 6 20

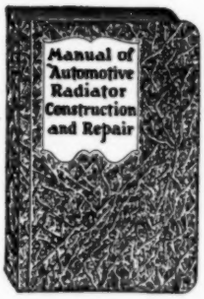
Books for Christmas Gifts

A very popular book—new edition being printed



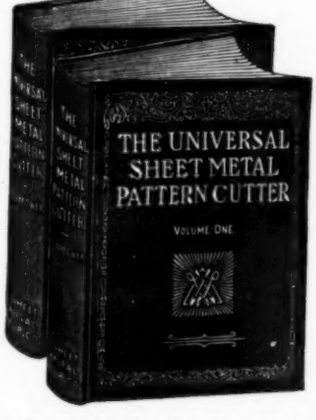
Exhaust and Blow Piping has had an unusually big demand. A fresh supply is due soon and delivery can be made for the Holidays. It is an unordinary valuable treatise on the planning, cost, estimation and installation of fan piping in all its branches giving all necessary guidance in fan work, blower and separator construction. 159 pages, 5x8 in. 51 figures. Cloth, **$2.00.**

The only book published on Auto Radiator Repairing



F. L. Curfman and T. H. Leet are the authors of this much used manual. Any one interested in Radiator Repairing will find the 185 pages of practical instructions and the 120 illustrations showing actual construction and repairing, a big help. In a condensed manner some four to five thousand answers to questions are given. It is thoroughly practical as both authors are men of wide experience in this work. Printed in large, easy to read type—a book that will be welcome as a gift. Measures 5¾x9 inches. **Price $2.50.**

The two biggest and best books on Sheet Metal Work



Here are two books that can't be beat as a holiday gift. They are the most practical and useful treatises on the subject.

Work of all the branches of the trade and the broadest scope of details are found—inside and outside work—small jobs and the most complicated are shown, explained and profusely illustrated.

The volumes are bound in heavy cloth and each measures 9x12 in. Each contain over 380 pages and 680 original drawings. **Price $7.50 each.**

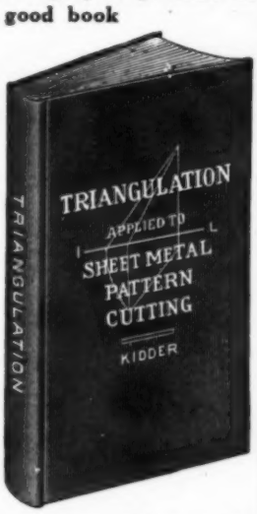
YOUR employees, those friends of yours in the trade or your fellow workers—if you're going to remember them this Christmas with a gift of some kind choose a few good trade books.

And yourself—if your folks don't know what to give you and you want trade books—leave this page where they'll see it.

Another suggestion—that fellow in your shop who reads **your** Artisan—make him a present of a subscription all his own.

A 10 per cent discount will be allowed on the total purchase price if a new subscription or renewal is ordered at the same time.

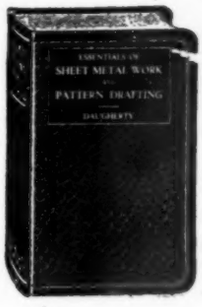
Triangulation thoroughly explained in this good book



For the man who desires a complete volume on this subject this manual will be an appreciated holiday present.

The sheet metal pattern cutter of today needs to be up-to-date—this book contains 268 pages of real helpful instructions, 123 illustrations, photographic and line drawn, which show sheet metal models made expressly for this work.

Measures 6 x 9 inches and is cloth bound. **Price $3.00.**



A small but excellent general sheet metal book

Professor J. S. Daugherty, a practical sheet metal worker and instructor of the Carnegie School of Technology, is the author of this handy volume. 181 pages of good, general and detailed instructions and many illustrations. **Price $1.50.**

Neubecker and A. Hopp

These two names are well known to every sheet metal worker. This is a new edition of a most practical self-instruction book published on the art of pattern drafting. It deals with construction work in light and heavy-gauge metal, skylights and roofing and cornice work, etc.

Give this book for a Christmas remembrance. 267 pages, 6½x9¾ in. 370 figures. Cloth bound. **Price $3.00.**

Home Instruction for Sheet Metal Workers

By William Neubecker. Edited by Frank X. Morlo.

Facts that you want to know and know how to use are crammed into every page of this new home instructor. It is a practical instruction manual for the apprentice, mechanic and master sheet metal worker, covering the course of instruction given to the students in the sheet metal department at the New York Trade School.

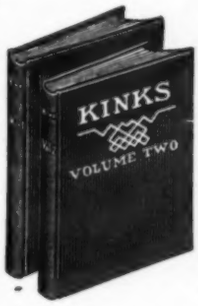
It includes detailed instructions on cutting, forming, soldering, preparing full-size details from architects' blueprints, developing the patterns, laying out the work on sheet metal, forming and bending on the brake and **setting the** work together.

Important features in the book are the chapters on skylight and louvre work, the subject being covered completely, including flat, hipped and pitched skylights, stationary and movable louvres, turret sash, gearing, etc.

It's a book that will give you the help you want.

Over 400 pages, 684 illustrations, bound in cloth, with 15 folding plates bound separately, postpaid, **$5.00.**

Two of the handiest books published



These two little books contain hundreds of "tricks of the trade," full of short cuts, labor saving methods and many practical ideas—all of which any sheet metal worker can use. A good collection of methods by which you can do many jobs in a quicker, handier way. These books "Kinks" should be read by every man in the trade — Cloth bound. 4½x7 in. **Price $1.00 each.**

If you desire more information, more complete descriptions of these books write us at once and we will gladly give the additional facts and chapter headings. All the books listed and briefly described on this page are widely read and the most popular books published for the sheet metal worker; so your selection from this advertisement is sure to please.

Place your orders now (shipments can be held until desired) to insure delivery.

SEND YOUR ORDERS OR CATALOG REQUESTS TO BOOK DEPT.

AMERICAN ARTISAN AND HARDWARE RECORD

620 SOUTH MICHIGAN AVENUE - - - CHICAGO, ILLINOIS

SHEARS.

	Per Doz.
Nickel Plated, Straight, 6"	$12 90
" " " 7"	14 85
" " " 8"	16 80
Japanned, Straight ....6"	11 00
" " ....7"	12 40
" " ....8"	13 80

SHEAVES, SLIDING DOOR.

Common.

Inches	3	4	5
Per set	$1 40	1 75	2 40

Hatfield's.

Per set	$1 80	2 10	2 75	25

SHINGLES.

	Per Square
Zinc (Illinois)	$15 00

SHOES.

Milcor.

Galv. Std. gauge, Plain or corg. round flat crimp...65@
26 gauge round flat crimp..45%
24 gauge round flat crimp..15@

Square Corrugated.

Standard gauge 50%
26 gauge 35%

Conductor .....60@

SHOVELS AND SPADES.

Coal.
Hubbard's.

No.	A	B	C	D
1	$16 00	15 10	14 45	13 70
2	16 35	15 60	14 85	14 10
3	16 75	16 00	16 25	14 45
4	17 10	16 35	16 60	14 85

Post Drains & Ditching.
Hubbard's.

Size	A	B	C
14"	17 15	16 40	15 65
16"	17 50	16 75	16 00
18"	17 85	17 10	16 85
20"	18 20	17 45	16 70
22"	18 55	17 80	17 05

Alaska Steel.

D-Handle	per doz.	$3 50
Long Handle	"	3 00

SKATES.

Roller.

Ball Bearing—Boys'	$1 50
Ball Bearing—Girls'	1 60

Ice.

Key Clamp Rocker, Men's and Boys'	0 70
Key Clamp Rocker, Men's and Boys'	1 03
Half Key Clamp Hockey, Women's and Girls'	0 96

SNAPS, HARNESS.
Covered Spring .....Add 30%
Judd's Pattern Add 33 1-6% to list

SNATHS.

Double Ring Bush..	per doz.	$9 75
Patent Loop, Bush..	"	10 00
Patent Loop, Grass.	"	8 75

SNIPS, TINNERS'.

Clover Leaf	40&10%
National	40&10%
Star	50%
Milcor	Net

SPRINGS, DOOR.

Perfect.

Nos.	2	3	4	5	6	7
Per doz.	45c	50c	55c	65c	80c	90c

Reliance.

	Light	Medium	Heavy
Per doz...	$1 80	2 40	3 75

Torrey's .....per doz. 1 65

SQUARES.

Steel and Iron.....Net
(Add for bluing, $3.00 per doz. net)
Mitre ..... "
Try ..... "
Try and Bevel..... "
Try and Miter..... "
Fox's .....per doz. $6 00
Winterbottom's 10%

STAPLES.

Blind.

Barbed	per lb.	21@22c
Butter, Tub.....	"	16@19c

Fence—

Polished	per 100 lbs.	$5 45
Galvanized ...	"	6 15

Netting.

Galvanized	per 100 lbs.	6 54

Wrought.
Wrought Staples, Hasps and Staples, Hasps, Hooks and Staples, and Hooks and Staples .....50&10%
Extra heavy 35%

STONES.

Axe.

Hindostan	per lb.	New Nets
More Grit	"	"
Washita	"	"

Emery.
No. 126.....per doz. New Nets

Oil—Mounted.

Arkansas Hard No. 7	per doz.	New Nets
Arkansas Soft	"	"
Washita No. 717	"	"

Oil—Unmounted.

Arkansas Hard	per lb.	New Nets
Arkansas Soft	"	"
Lily White...	"	"
Queer Creek..	"	"
Washita	"	"

Scythe.

Black Diamond	per gro.	New Nets
Crescent	"	"
Green Mountain	"	"
LaMolle	"	"
Extra Quinnebog	"	"
Red End	"	"

STOPS, BENCH.

No. 10 Morrill pattern	per doz.	$11 00
No. 11 Stearns pattern	"	10 00
No. 15 Smith pattern	"	7 00

STOPPERS, FLUE.

Common .....per doz.		$1 10
Gem, flat, No. 3...	"	1 00
Gem, No. 1.....	"	1 10

STRETCHERS.

Carpet.

Bullard's .....per doz.		$3 90
Excelsior	"	5 25
Malleable Iron ...	"	70
Perfection	"	6 30
King	"	4 50

Wire.

O. S. Elwood, No. 1 per doz.		Nets
O. S. Elwood, No. 2	"	"

SWIVELS.

Malleable Iron .....per lb.		$0 10
Wrought Steel .....per gro.		4 50

TACKS.

Bill Posters' 6-oz. 25-lb. boxes per lb. 15c
Upholsterers' 6-oz., 25-lb. boxes, per lb.....15½c

TAPES, MEASURING.

Asses' Skin .....List&40%

THERMOMETERS.

Tin Case .....per doz.	80c&	$1 25
Wood Back...	"	$2 00& 12 00
Glass	"	12 00

TIES.

Bale.

Single Loop, carload lots	75&7%
Single Loop, less than car lots	70&15%

TRAPS.

Mouse and Rat.	Per gross
Sure Catch Mouse Traps..	$ 2 10
Vim Mouse Traps.....	2 10
Short Stop Mouse Traps.	1 80
Wood Choker Mouse Traps, 4 hole.....	10 25
	Per doz.
Sure Catch Rat Traps....	$0 90
Dead Easy Rat Traps....	80

Packed in One Bushel Band Stave Baskets.

	List per bushel
Sure Catch Mouse Traps (360 Traps) .....$	5 25
Short Stop Mouse Traps (360 Traps)	4 50
Sure Catch Rat Traps (54 Traps)	3 60
Short Stop Rat Traps (54 Traps)	3 15

Assorted Mouse and Rat Traps.

	List per bushel
Sure Catch (216 Mouse Traps and 26 Rat Traps)	$4 90
Short Stop (216 Mouse Traps and 26 Rat Traps)	4 25

TROWELS.

Cement.

Atkins	No. 6.....	19 50
"	No. 9.....	25 50

TWINE.

White Cotton.
Eureka, 4-ply .....per lb. 30c

Jute.
3-ply and 6-ply Bale Lots 22½c

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Whitney Mfg. Co., W. A..... —
Whitney Metal Tool Co..... —
Wise Furnace Co..... —
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Zideck Auto Radiator School 49

Please mention
AMERICAN ARTISAN
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VALLEY.

Formed Valley Galvanized Steel 60-5%
Milcor .....
Galv. formed or roll.....60%

VISES.

No. 700, Hand, Inches	4½	5	5½
Doz.	$11 15	13 00	14 85

No. 701. In.	4	5	6
Doz.	$11 15	13 00	16 70

No. 1, Genuine Wentworth, Noiseless Saw....per doz. 9 25
No. 3, Genuine Wentworth, Noiseless Saw....per doz. 12 75
No. 500, All Steel Folding Saw .....per doz. 16 00

WASHERS.

Cast.
Over ½ in. barrel lots, per 100 lbs.....$6 25
Iron and Steel.

In.	5/16	⅜	½	⅝	¾
	10¼c	9¼c	7¾c	7½c	7 2/5c

WEATHER STRIPS.

Metallic Stitched.

½ in., per 100 ft.	$1 80
¾ in., per 100 ft.	2 20

Wood & Felt.

⅝ in., per 100 ft.	1 56
⅞ in., per 100 ft.	1 56

WEDGES.

Ax.	per doz. Nets
Galling	.....per lb. Nets
Saw	.....per lb. 8½c

WEIGHTS.

Hitching .....per lb. Nets
Sash—f. o. b. Chicago
Smaller lots, per ton.... 50 00

WHEEL BARROWS.

Common Wood Tray		$3 00
Steel Tray		4 50
Angle leg, garden		5 75

WHEELS.

Carborundum 50%
Emery 60%

Well, Ins.....	8	10	12
Per doz.....	$5 50	7 25	8 50

12-in. heavy hoisting, per doz. $25 00

WIRE.

Plain annealed wire, No. 8 per 100 lbs.	$3 20
Galvanized barb wire, per 100 lbs.	4 10
Wire cloth — black painted, 12-mesh, per 100 sq. ft....	1 90
Cattle Wire—galvanized catch weight spool, per 100 lbs.	4 10
Galvanized Hog wire, 80 rod spool, per spool	3 85
Galvanized plain wire, No. 3, per 100 lbs.	3 70

WOOD FACES.

50% off list.

WRENCHES.

Coes Steel Handle,	6-in.	60%
" " "	8-in.	60%
" " "	10-in.	60%
" " "	12-in.	60%
Coes Knife-Handle,	6-in.	60%
" " "	8-in.	60%
" " "	10-in.	60%
" " "	12-in.	60%
Coes All Patterns		60%

Knife Handle Pattern.
No. 63, Screw Wrench, List plus 30%
No. 60, Steel Handle.....30%

WRINGERS.

No. 790, Guarantee, per doz.		$49.50
No. 770, Bicycle ...	"	47 00
No. 670, Domestic .	"	43 50
No. 110, Brighton ..	"	39 00
No. 750, Guarantee.	"	51 00
No. 740, Bicycle ...	"	48 50
No. 22, Pioneer ...	"	35 50
No. 2, Superb ...	"	25 50